# AXIS 210/210A/211/211A
# Network Cameras

# User's Manual

## About this Document

This manual is intended for administrators and users of the AXIS 210/210A/211/211A Network Camera and applies to firmware release 4.30. It includes instructions for using and managing the AXIS 210/210A/211/211A on your network. Previous experience of networking will be of use when using this product. Some knowledge of UNIX or Linux-based systems may also be beneficial, for developing shell scripts and applications. Later versions of this document will be posted to the Axis Website, as required. See also the product's online help, available via the Web-based interface.

## Safety Notices Used In This Manual

**Caution!** - Indicates a potential hazard that can damage the product.
**Important!** - Indicates a hazard that can seriously impair operation.
Do not proceed beyond any of the above notices until you have fully understood the implications.

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This product contains licensed third-party software. See the menu item "About" in the product's user interface for more information.

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The source code is available from:
http://developer.apple.com/darwin/projects/bonjour/

## Legal Considerations

Video and audio surveillance can be prohibited by laws that vary from country to country. Check the laws in your local region before using this product for surveillance purposes. This product includes one (1) MPEG-4 decoder license. To purchase further licenses, contact your reseller.

## Electromagnetic Compatibility (EMC)

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Re-orient or relocate the receiving antenna. Increase the separation between the equipment and receiver. Connect the equipment to an outlet on a different circuit to the receiver. Consult your dealer or an experienced radio/TV technician for help. Shielded (STP) network cables must be used with this unit to ensure compliance with EMC standards. If the I/O terminal connector is used, a ferrite core (available e.g. from Axis) should be fitted around the wires in order to ensure compliance with EMC standards.

**USA –** This equipment has been tested and found to comply with the limits for a Class B computing device pursuant to Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his/her own expense will be required to take whatever measures may be required to correct the interference.

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**Japan –** This is a class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

**Australia –** This electronic device meets the requirements of the Radio communications (Electromagnetic Compatibility) Standard 1998 AS/NZS 3548.

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## Support

Should you require any technical assistance, please contact your Axis reseller. If your questions cannot be answered immediately, your reseller will forward your queries through the appropriate channels to ensure a rapid response. If you are connected to the Internet, you can:

- download user documentation and firmware updates
- find answers to resolved problems in the FAQ database. Search by product, category, or phrases
- report problems to Axis support by logging in to your private support area
- visit Axis Support at www.axis.com/techsup/

## Safety Notice - Battery Replacement

The AXIS 210/210A/211/211A uses a 3.0V CR2032 Lithium battery as the power supply for its internal real-time clock (RTC). Under normal conditions this battery will last for a minimum of 5 years. Low battery power affects the operation of the RTC, causing it to reset at every power-up. A log message will appear when the battery needs replacing. The battery should not be replaced unless required!

If the battery does need replacing, please observe the following:

- Danger of Explosion if battery is incorrectly replaced
- Replace only with the same or equivalent battery, as recommended by the manufacturer.
- Dispose of used batteries according to the manufacturer's instructions.

AXIS 210/210A/211/211A User's Manual
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# Introduction

This manual covers the following Axis Network Camera models:

- AXIS 210
- AXIS 210A
- AXIS 211
- AXIS 211A

All instructions and information in this manual are valid for all four models unless otherwise stated.

## Product features

The AXIS 210/210A/211/211A cameras are part of the latest generation of fully featured Axis Network Cameras, and are all based on the AXIS ARTPEC-2 compression chip.

The most basic model of the four is the AXIS 210. The other models support further features as, listed in the overview below. All models support the following features:

- Video streams from the camera available on the network as real-time, full frame rate Motion JPEG and/or MPEG-4 video streams.
- Video Motion Detection - this can be used to trigger e.g. image uploads when there is activity in the video image.
- Scheduled image uploads.
- IP address filtering and multilevel password protection.
- Alarm input and output, which can be connected to various external devices, e.g. door sensors and alarm bells.
- Multiple video resolutions.
- Simultaneous access by up to 20 viewers when using Motion JPEG. If MPEG-4 multicast is used, the number of viewers is unlimited, but each viewer still needs a separate MPEG-4 license. One license is included in the product, additional licenses can be purchased separately.

- Privacy masking allows the concealment of parts of the image that should not be viewable. The mask can be an uploaded image file, or it can take the form of up to 3 configurable black areas.
- Built-in web server that provides full access to all features via a standard web browser.
- Built-in scripting tool that allows the creation of basic applications. For advanced functionality, the cameras can be accessed via the AXIS HTTP API (more info at www.axis.com/developer).

## Extra features

### DC-Iris (AXIS 211/211A only)

The AXIS 211/211A features a varifocal DC-Iris, which automatically regulates the amount of light entering the camera. Tele/wide and focus are adjusted manually with the aid of the pullers mounted on the lens.

### (PoE) Power over Ethernet (AXIS 210A/AXIS 211/211A only)

Supporting PoE network transformers conforming to IEEE 802.3af, the camera can be powered directly from the network cabling.

### Two-way audio (AXIS 210A/211A only)

Two-way audio capability for up to 20 simultaneous users. Audio communication can be bi-directional (full-duplex), push to talk (half-duplex) or in one direction only (simplex).

The AXIS 210A/211A has an integrated mono microphone, but there is also an audio input for connecting an external microphone or other source producing a line level signal. An active speaker with a built-in amplifier can be connected to the audio output to enable two-way communication.

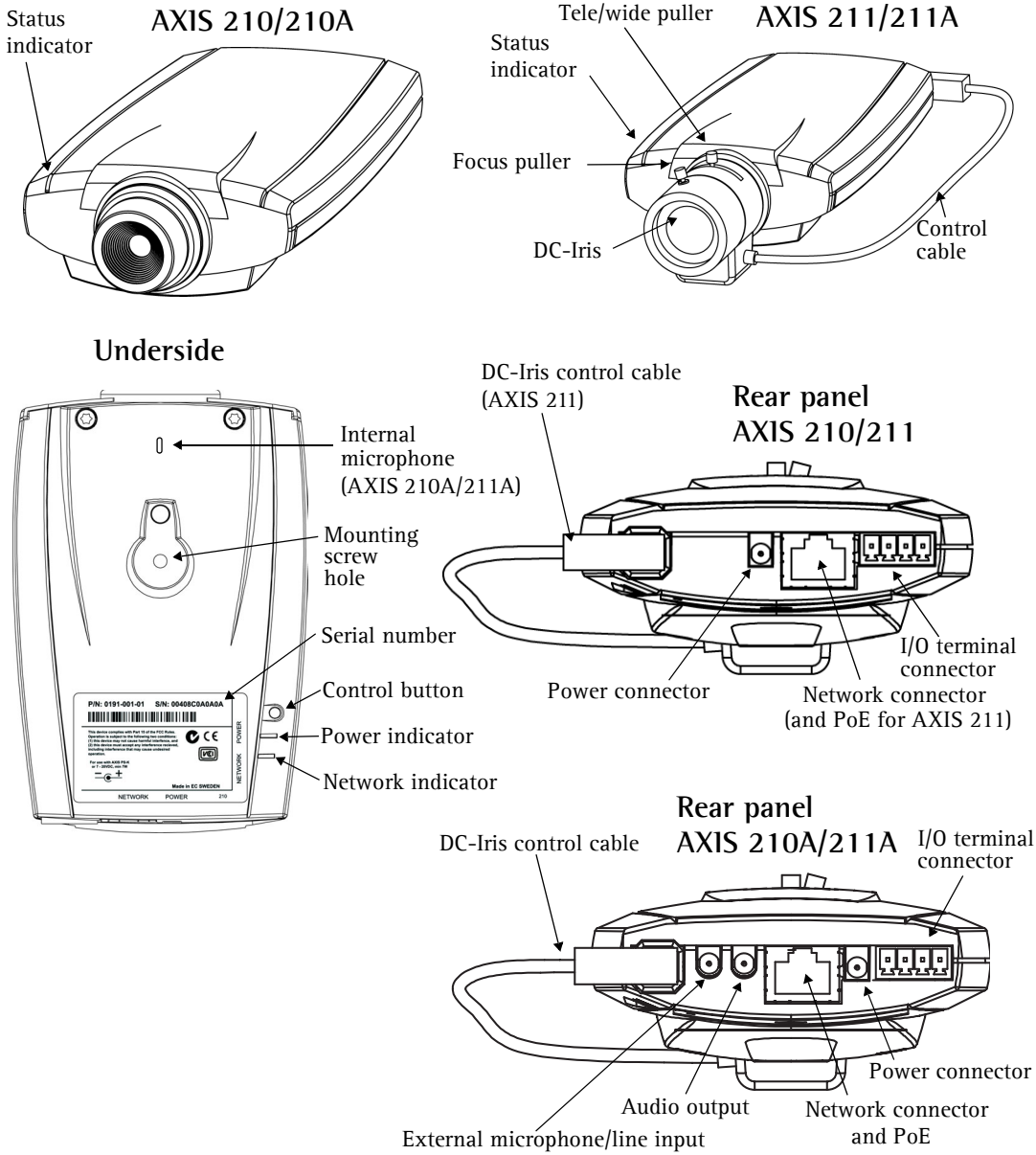
### SNMP (AXIS 210A/211A only)

The Simple Network Management Protocol allows the remote management of network devices.

### HTTPS (AXIS 210A/211A only)

The AXIS 210A/211A supports encrypted browsing using HTTPS.

# Overview




**Power Connector** - For connection of the PS-K power adapter (included).

**I/O Connector** - The I/O terminal connector provides the physical interface to one transistor output, one digital input and an auxiliary connection point for DC power. For more information, see *The I/O Terminal Connector*, on page 46.

**Network Connector** - The camera connects to the network via a standard network connector. Supporting NWAY, the camera detects the speed of the local network segment (10BaseT/100BaseTX Ethernet). This socket can also be used to power the AXIS 210A and the AXIS 211/211A via PoE (Power over Ethernet).

**Audio Output** - Audio output (line level), which can be connected to a public address (PA) system or an active speaker with a built-in amplifier. A pair of headphones can also be attached. A stereo connector must be used for the audio out.

**External Microphone/Line Input** - One 3.5mm input for a mono microphone, or for line-in mono signal (only the left channel is used from a stereo signal).

**Serial Number** - This number is used during installation.

**Control Button** - Press this button to install using the AXIS Internet Dynamic DNS Service (see page 11) or to restore the factory default settings, as described in *Resetting to the Factory Default Settings, on page 45*.

## LED Indicators

After completion of the startup and self test routines, the multi-colored Network, Status, and Power LED indicators flash as follows:

| | | |
|---|---|---|
| **Network** | Amber | Steady for connection to 10 Mbit/s network. Flashes for network activity. |
| | Green | Steady for connection to100 Mbit/s network. Flashes for network activity. |
| | Red | Flashes rapid red, together with the Status indicator, for hardware error. |
| | Unlit | No connection. |
| **Status** | Green | Shows steady green for normal operation. Can be configured to flash green at intervals whenever the camera is accessed. See the online help for more information. |
| | Unlit | When configured for "no flash" on camera access. |
| | Amber | Shows steady amber during reset to factory default or when restoring settings. |
| | Red | Slow flash for failed upgrade (see *Emergency Recovery Procedure, on page 49*).<br>Rapid flash, together with the Network indicator, for hardware error. |
| **Power** | Green | Normal operation. |
| | Amber | Flashes green/amber during firmware upgrade. |

# Accessing the Camera

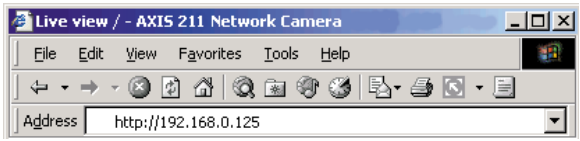
Follow the instructions in the AXIS 210/210A/211/211A Installation Guide to install your camera.

The cameras can be accessed with most standard operating systems and browsers. The recommended browser is Internet Explorer with Windows, and Mozilla with other operating systems. See also the *Technical Specifications,* on page 49.

**Note:** To view streaming video in Microsoft Internet Explorer, you must set your browser to allow the AXIS Media Control (AMC) to be installed on your computer. The first time an MPEG-4 video stream is accessed AMC also installs an MPEG-4 decoder for viewing the video streams. As a license is required for each instance of the decoder, the product administrator may have disabled the installation. See page 23 for more information. If your workstation restricts the use of additional software components, the cameras can be configured to use a Java applet for updating JPEG images. See the online help for more information.

## Access From a Browser

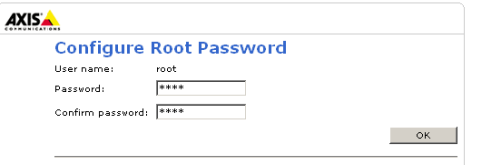
1. Start a browser (e.g. Internet Explorer, Mozilla)
2. Enter the IP address or host name of the cameras in the **Location/Address** field of your browser.




3. If this is the first time the camera is accessed, see *Setting the Password,* on page 10. Otherwise enter your user name and password, as set by the administrator.
4. The camera's **Live View** page is now displayed in your browser.

**Note:** The layout of the live view page in the cameras may have been customized to meet specific requirements. Consequently, some of the examples and functions featured here may differ from those displayed on your own Live View page.

## Setting the Password




1. When accessing a camera for the first time, the '**Configure Root Password**' dialog will be displayed on the screen.
2. Enter a password and then re-enter it, to confirm the spelling. Click **OK**.
3. The '**Enter Network Password**' dialog will appear. Enter the User name: **root**
   **Note:** The default administrator user name **root** is permanent and cannot be deleted.
4. Enter the password as set in step 2 above, and click **OK**. If the password is lost, the cameras must be reset to the factory default settings. See page 45.
5. If required, click **Yes** to install the AXIS Media Control (AMC). You will need administrator rights on the computer to do this.

## Accessing the camera from the Internet

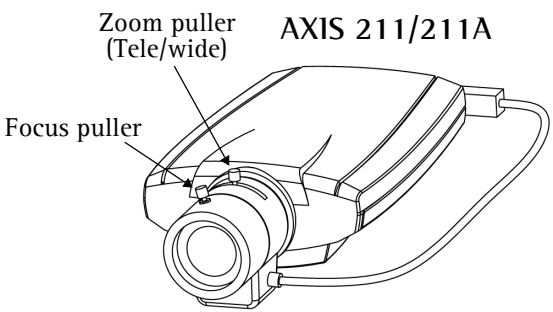
Once installed, a camera is accessible on your local network (LAN). To access the camera from the Internet you must configure your broadband router to allow incoming data traffic. For security reasons this is usually done on a specific port. Please refer to the documentation for your broadband router for further instructions.

For more information, please visit the AXIS Internet Dynamic DNS Service at www.axiscam.net or, for Technical notes on this and other topics, visit the Axis Support Web at www.axis.com/techsup

## Focusing

To focus the **AXIS 210/210A**, simply turn the adjustment ring on the lens until the focus is satisfactory.

To focus the **AXIS 211/211A**, follow the instructions below.



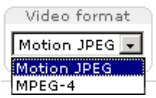

1. From the **Basic Configuration** page in the setup tools, open the **Focus adjustment** page.
2. Set the DC-Iris to *Disabled* and click **Save**.
3. Unscrew the zoom puller on the lens by turning it anti-clockwise. Adjust the zoom setting as required. Re-tighten the zoom puller.
4. Unscrew the focus puller on the lens. Adjust the focus as required. Re-tighten the focus puller.
5. From the Focus adjustment page, set the DC-Iris to *Enabled* and click **Save**.

**Note:** The DC-Iris should always be disabled while focusing the camera. This opens the iris to its maximum, which gives the smallest depth of field and thus the best conditions for correct focusing. When the focus is set with this method it will then be maintained in any light conditions.

## The Live View Page

Depending on whether or not the Live View page has been customized, the buttons described below may or may not be visible.

To resize the video image, click the **View Size** buttons: half-size (x1/2), full-size (x1), x2 or x4. Note that this does not change the video image's resolution, but simply how it is displayed. Changing the **View size** is not available in Sequence Mode.




The Video Format drop-down list allows the video format on the Live View page to be temporarily changed.

The **Output buttons** control the output directly from the **Live View** page. These buttons are configured under **Setup > Live View Config > Layout**.

**Pulse** - click this button to activate the output for a defined period of time, e.g. to switch on a light for 20 seconds.

**Active/Inactive** - click these buttons to manually start and stop a connected device, e.g. switch a light on/off.

These buttons start and stop the **Sequence Mode**. This mode is created in **Setup > Live View Config > Sequence mode**, and automatically displays the view from 2 or more video sources at set intervals.

From the **Source** list, select the desired external video source. Note that Sequence Mode must be stopped before selecting a source from this list.

The **Action buttons** can trigger an event directly from the **Live View** page. These are configured under **Setup > Live View Config > Layout**.

The **Snapshot** button saves a snapshot of the video image currently being displayed. Right-click on the video image to save it in JPEG format on your computer. This button is primarily intended for use when the AMC viewer toolbar is not available.

The **AMC viewer toolbar** (AXIS Media Control) is available in **Microsoft Internet Explorer only.** It displays the following buttons:

The **Play/Stop** button starts and stops the live video stream.

The **Snapshot** button saves a snapshot of the video image currently being displayed. The Snapshot function and the target directory for saving snapshots can be configured from the AMC Control Applet in the Windows Control Panel (Internet Explorer only).

Click the **View Full Screen** button to make the video image fill the entire screen area. No other windows will be visible. Press **Esc** (Escape) on the computer keyboard to exit full screen.

### AMC audio controls for AXIS 210A/211A

There are also controls for controlling the client computer's speaker output and microphone sensitivity. These controls are only available when audio is enabled, see *Audio Settings,* on page 24. Push-to-talk settings are made in the AMC control panel, see *AXIS Media Control (Viewing Client),* on page 14.

Click the **Speaker** and **Microphone** buttons to switch the sound off and on for the speaker and microphone, respectively.

Use the sliders to control the volume on the speaker and microphone. The volume can be set between 0 and 100. The Buffer slider controls the size of the buffer for audio. A higher level will reduce audio break-up, but may introduce a noticeable lag in audio transmission. There are four settings i.e. min, low, high and max.

When using **Half-duplex** mode, this button toggles between allowing you to speak and listen. The first icon indicates that you can talk and the speaker attached to the camera will play your voice. The second indicates that you will hear audio from the camera, but no audio will be sent to any web clients.

When in **simplex** talk mode, the icon toggles between allowing you to speak and is dimmed when you do not want other clients to receive any audio.

# Video Streams

The AXIS 210/210A/211/211A provides several different image and video formats. The type to use depends on your requirements and on the properties of your network.

The Live View page in the AXIS 210/210A/211/211A provides access to Motion JPEG and MPEG-4 video streams, as well as to single JPEG images. Other applications and clients can also access these video streams/images directly, without going via the Live View page.

## Video Stream Types

### Motion JPEG

This format uses standard JPEG still images in the video stream. These images are then displayed and updated at a rate sufficient to create a stream that shows constantly updated motion.

The Motion JPEG stream uses considerable amounts of bandwidth, but also provides excellent image quality and access to each and every individual image contained in the stream.

Note also that multiple clients accessing Motion JPEG streams can use different image settings.

### MPEG-4

This is a video compression standard that makes good use of bandwidth, and which can provide high-quality video streams at less than 1 Mbit/s.

The MPEG-4 standard provides scope for a large range of different coding tools for use by various applications in different situations, and the AXIS 210/210A/211/211A provides certain subsets of these tools. These are represented as **Video object types**, which are selected for use with different viewing clients. The supported video object types are:

- **Simple** - sets the coding type to H.263, as used by e.g. QuickTime™.
- **Advanced Simple** - sets the coding type to MPEG-4 Part 2, as used by AMC (AXIS Media Control)

When using MPEG-4 it is also possible to control the bit rate, which in turn allows the amount of bandwidth usage to be controlled. CBR (constant bit rate) is used to achieve a specific bit rate by varying the quality of the MPEG-4 stream. When using VBR (variable bit rate), the quality of the video stream is kept as constant as possible, at the cost of a varying bit rate.

**Notes:**
- MPEG-4 is licensed technology. The AXIS 210/210A/211/211Aincludes one viewing client license. Installing additional unlicensed copies of the viewing client is prohibited. To purchase additional licenses, contact your Axis reseller.
- All clients viewing the MPEG-4 stream must use the same set of coding tools.

## MPEG-4 protocols and communication methods

To deliver live streaming video over IP networks, various combinations of transport protocols and broadcast methods are employed.

- RTP (Realtime Transport Protocol) is a protocol that allows programs to manage the real-time transmission of multimedia data, via unicast or multicast.
- RTSP (Real Time Streaming Protocol) serves as a control protocol, to negotiate which transport protocol to use for the stream. RTSP is thus used by a viewing client to start a unicast session, see below.
- UDP (User Datagram Protocol) is a communications protocol that offers limited service for exchanging data in a network that uses the Internet Protocol (IP). UDP is an alternative to the Transmission Control Protocol (TCP). The advantage of UDP is that it is not required to deliver all data and may drop network packets when there is e.g. network congestion. This is suitable for live video, as there is no point in re-transmitting old information that will not be displayed anyway.
- Unicasting is communication between a single sender and a single receiver over a network. This means that the video stream goes independently to each user, and each user gets their own stream. A benefit of unicasting is that if one stream fails, it only affects one user.
- Multicast is bandwidth-conserving technology that reduces bandwidth usage by simultaneously delivering a single stream of information to multiple network recipients. This technology is used primarily on delimited networks (intranets), as each user needs an uninterrupted data flow and should not rely on network routers.

## How to stream MPEG-4

Deciding on the combination of protocols and methods to use depends on your viewing requirements, and on the properties of your network. Setting the preferred method(s) is done in the control applet for AMC, which is found in the Windows Control Panel. When this has been set, AMC will test all the selected methods in the specified order, until the first functioning one is found.

### RTP+RTSP

This method (actually RTP over UDP and RTSP over TCP) should be your first consideration for live video, especially when it is important to always have an up-to-date video stream, even if some images do get dropped. This can be configured as multicast or unicast.

Multicasting provides the most efficient usage of bandwidth, especially when there are large numbers of clients viewing simultaneously. Note however, that a multicast broadcast cannot pass a network router unless the router is configured to allow this. It is thus not possible to multicast over e.g. the Internet.

Unicasting should be used for video-on-demand broadcasting, so that there is no video traffic on the network until a client connects and requests the stream. However, as more and more unicast clients connect, the traffic on the network will increase and may cause congestion. Although there is a maximum of 20 unicast viewers, note that all multicast users combined count as 1 unicast viewer.

### RTP/RTSP

This unicast method is RTP tunneled over RTSP. This can be used to exploit the fact that it is relatively simple to configure firewalls to allow RTSP traffic.

### RTP/RTSP/HTTP or RTP/RTSP/HTTPS

These two methods can also be used to traverse firewalls. Firewalls are commonly configured to allow the HTTP protocol, thus allowing RTP to be tunneled.

## The AXIS Media Control

The recommended method of accessing live video (MPEG-4 and/or Motion JPEG) from the AXIS 210/210A/211/211A is to use the AXIS Media Control (AMC) in Microsoft Internet Explorer in Windows. This ActiveX component is automatically installed on first use, after which it can be configured by opening the AMC Control Panel applet from the Windows Control Panel. Alternatively, right-click the video image in Internet Explorer.

## Other methods of accessing the video stream

Video/images from the AXIS 210/210A/211/211A can also be accessed in the following ways:

- If supported by the client, the AXIS 210/210A/211/211A can use Motion JPEG server push to display video. This option maintains an open HTTP connection to the browser and sends data as and when required, for as long as required.
- As single JPEG images in a browser. Enter e.g. the path: http://<ip>/axis-cgi/jpg/image.cgi?resolution=320x240
- Windows Media Player. This requires AMC and the MPEG-4 decoder to be installed. The paths that can be used are listed below in the order of preference.
    - Unicast via RTP: axrtpu://<ip>/mpeg4/media.amp
    - Unicast via RTSP: axrtsp://<ip>/mpeg4/media.amp
    - Unicast via RTSP, tunneled via HTTP: axrtsphttp://<ip>/mpeg4/media.amp
    - Unicast via RTSP, tunneled via HTTPS: axrtsphttps://<ip>/mpeg4/media.amp
    - Multicast: axrtpm://<ip>/mpeg4/media.amp

**Note:** <ip> = IP address.

## Other MPEG-4 clients

Although it may be possible to use other clients to view the MPEG-4 stream, this is not guaranteed by Axis.

For some other clients, e.g. QuickTime™ the Video Object Type must be set to *Simple*. It may also be necessary to adjust the advanced MPEG-4 settings.

To assess the video stream from e.g. QuickTime™ the following path can be used:

rtsp://<ip>/mpeg4/media.amp

This path is for all supported methods, and the client will negotiate with the AXIS 210/210A/211/211A to determine exactly which transport protocol to use.

**Note:** <ip> = IP address.

## Audio Stream Types (AXIS 210A/211A only)

The stream types for audio are:

- G.711 - International standard for encoding wired-telephone audio. Uses PCM samples to compress audio where higher signal values are compressed more than lower values. In Axis products, this sets the coding type to µ-law 64 kbit/s.
- G.726 - Uses PCM samples to code the difference between samples (ADPCM). Reduces bandwidth without losing too much useful audio. In Axis products, this sets the coded bitrate to 24 or 32 kbit/s.

All stream types are ITU-T standards and operate on frequencies up to 4 kHz.

## Audio transmission methods (AXIS 210A/211A only)

The audio stream can be accessed in the Live View page via Motion JPEG or MPEG-4.

### Using Motion JPEG

The basic audio transmission method used in conjunction with Motion JPEG video streaming is transmission over HTTP. The video and audio streams are not synchronized when using Motion JPEG, so the streams may be slightly out of sync. The latency in any stream should be low, but this will depend on the network infrastructure.

### Using MPEG-4

When using MPEG-4, audio is streamed using the same protocol as the video stream.

When audio is transmitted using MPEG-4, the AXIS 210A/211A sends synchronization information along with the streams to the client performing the synchronization.

**Note:** Audio is streamed from the client to the server over HTTP when using Motion JPEG and MPEG-4.

## Accessing the Audio Streams

In addition to accessing audio in the Live View page using AMC, audio from the AXIS 210A/211A can also be accessed in the following ways:

### HTTP API

You can read about accessing audio for the other protocols through the HTTP-API at http://www.axis.com/techsup

### QuickTime/Windows Media Player

It is possible to use QuickTime and Windows Media Player to listen to the audio stream using the same methods to access video streams.

# Setup Tools

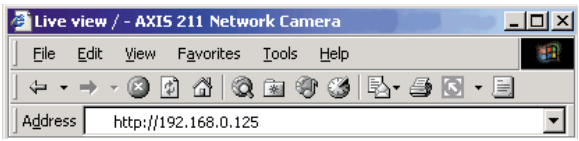
This section describes how to configure the cameras, and is intended for product **Administrators,** who have unrestricted access to all the Setup tools, and **Operators**, who have access to the settings for Video & Image, Audio, Live View Config and Event Configuration.

The cameras is configured under **Setup** from a standard browser (see *Technical Specifications,* on page 54).

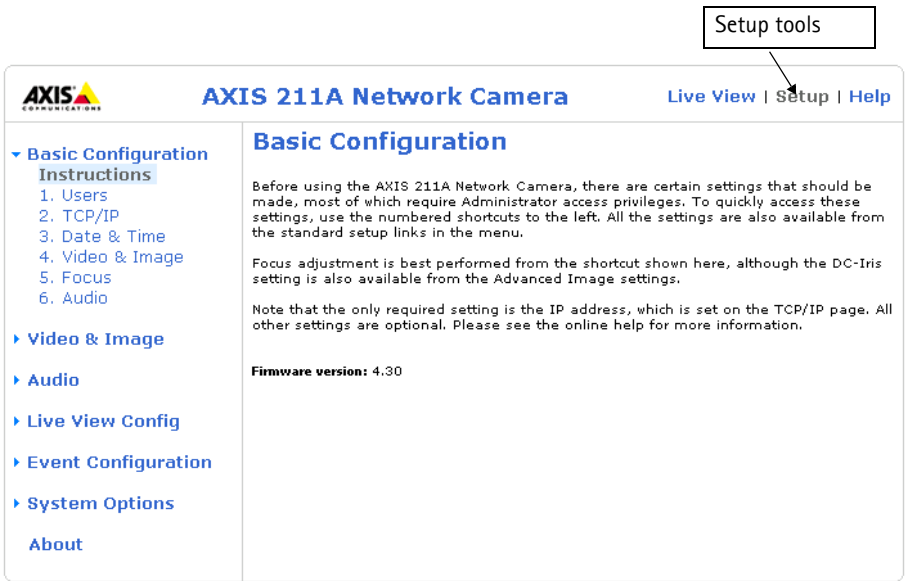
## Accessing the Setup tools

Follow the instructions below to access the Setup Tools from a browser.

1. Start your browser and enter the IP address or host name of the cameras in the location/address field.

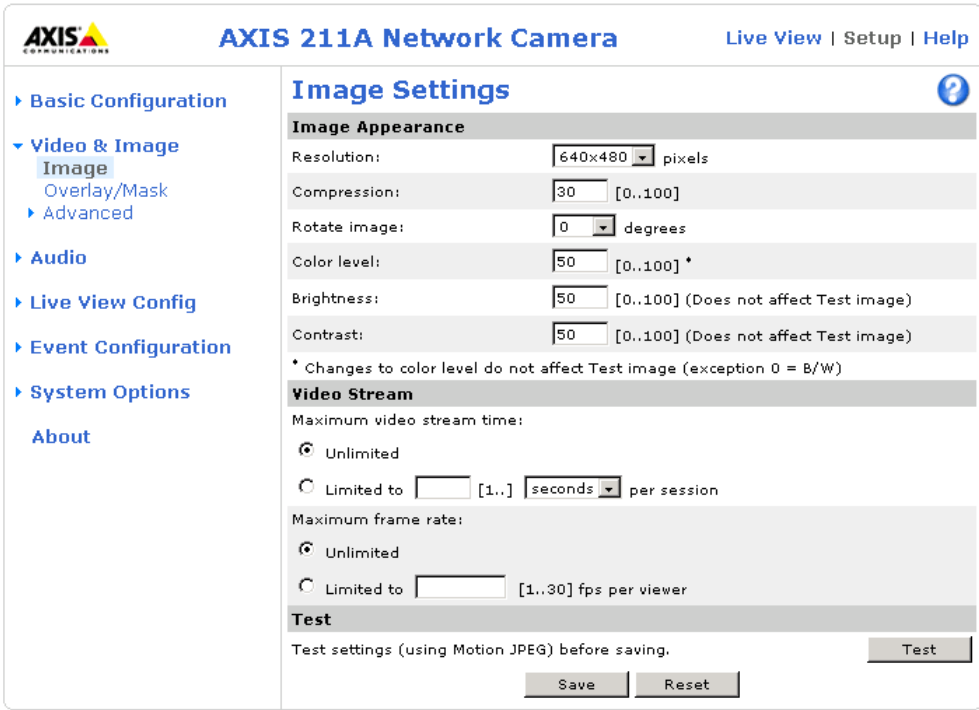



2. The **Live View** page is now displayed. Click **Setup** to display the **Setup** tools.


Setup tools
AXIS 211A Network Camera
Live View | Setup | Help
Basic Configuration
Instructions
1. Users
2. TCP/IP
3. Date & Time
4. Video & Image
5. Focus
6. Audio
Video & Image
Audio
Live View Config
Event Configuration
System Options
About
Basic Configuration
Before using the AXIS 211A Network Camera, there are certain settings that should be made, most of which require Administrator access privileges. To quickly access these settings, use the numbered shortcuts to the left. All the settings are also available from the standard setup links in the menu.
Focus adjustment is best performed from the shortcut shown here, although the DC-Iris setting is also available from the Advanced Image settings.
Note that the only required setting is the IP address, which is set on the TCP/IP page. All other settings are optional. Please see the online help for more information.
Firmware version: 4.30

# Video and Image settings

The following descriptions offer examples of the features available in the cameras. For details of each setting, please refer to the online help available from the setup tools. Click to access the online help.




## Image Settings

### Image Appearance

Adjust these settings to optimize the video images according to your requirements.

All configuration of images and overlays will affect the camera's overall performance, depending on how it is used and on the available bandwidth. Lower compression improves video image quality, but increases the bandwidth.

The video image can be rotated and fine-tuned by adjusting the color level, the brightness, and the contrast. Please see the online help for further information on these settings.

Changed video image settings have immediate effect on the MPEG-4 stream, but the Motion JPEG stream will have to be started (or restarted) before the settings take effect.

### Video Stream

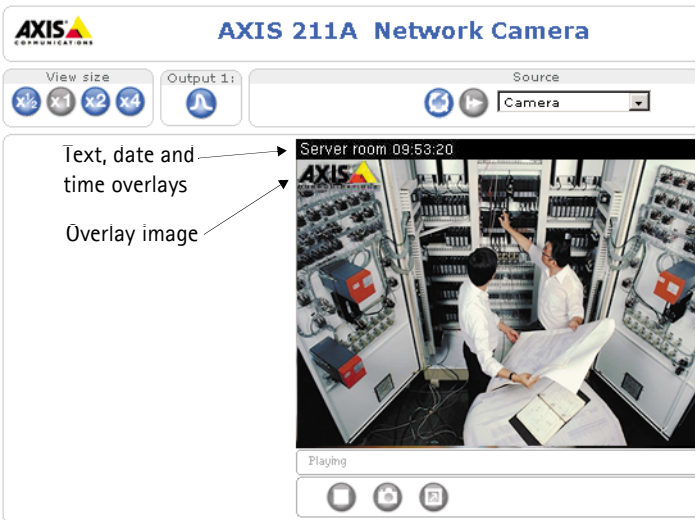
Define the maximum **video stream time** per session in seconds, minutes or hours. When the set time has expired, a new stream can be started by refreshing the page in the Web browser. For unlimited video stream time, set this value to 0. This setting is only applicable to Motion JPEG.

The **frame rate** allowed to each viewer can also be limited, to avoid bandwidth problems on the network.

### Test

To preview the image before saving, click **Test**. Note that the preview image will be in JPEG format, even though the settings are valid both for Motion JPEG and MPEG-4.

## Overlay/Mask Settings




### Text Overlay

**These** settings enable you to place text at the top or bottom of an image, e.g. date, time or some other text.

### Overlay/Mask Type

When using an image overlay, select from the following options the type to use:

- Uploaded image as overlay - usually used to provide extra information in the video image.
- Uploaded image as privacy mask - conceals part of the video image.
- Configurable areas as privacy masks - up to 3 black areas are used to conceal parts of the video image.

The difference between an overlay and a privacy mask is that a privacy mask cannot be bypassed by accessing the video stream with the help of the AXIS HTTP API, whereas an overlay can.

Selecting the overlay/mask type will display further settings available for the selected type. See the online help for further information.

## Upload and use an overlay/mask

To upload an overlay image/privacy mask to the camera:

1. Select the type of overlay to use in **Overlay/Mask Type**.
2. In the field **Upload own image**, click the **Browse** button and locate the image file on your computer or server.
3. Click the **Upload** button and follow the on-screen instructions.

To use an already uploaded image:

1. Select an uploaded image from the **Use image** drop-down list.
2. Place the image at the required location by entering the x and y coordinates.
3. Click **Save.**

## Overlay image/privacy mask requirements

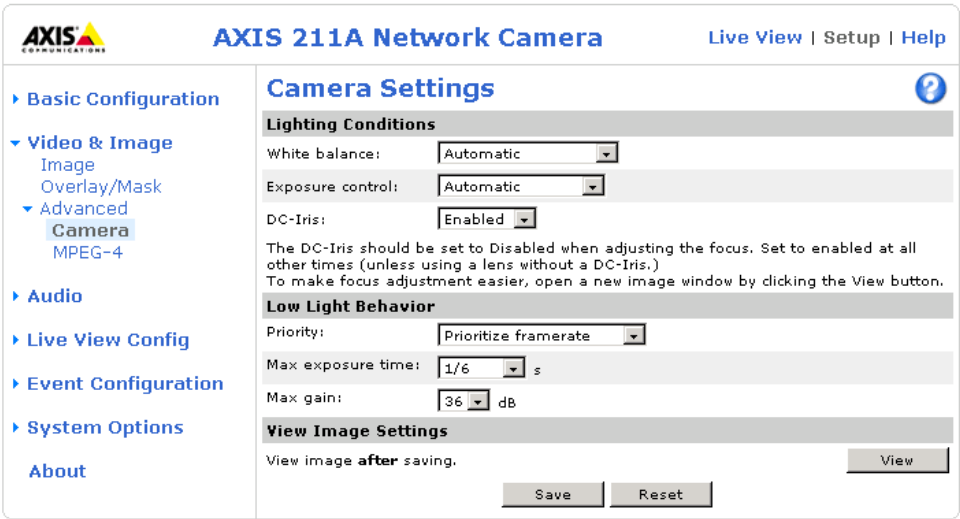
| Image Formats | Image Size |
|---|---|
| • Windows 24-bit BMP (full color)<br>• Windows 4-bit BMP (16 colors) | The height and width of the overlay image in pixels must be exactly divisible by 4. |

There are a number of limitations when using overlay images and privacy masks, such as the size and positioning of images/masks. Please refer to the online help for more information.

# Advanced Settings

These pages provide various settings for fine-tuning the video image. Note that the advanced settings available depend on the camera model.

## Camera Settings



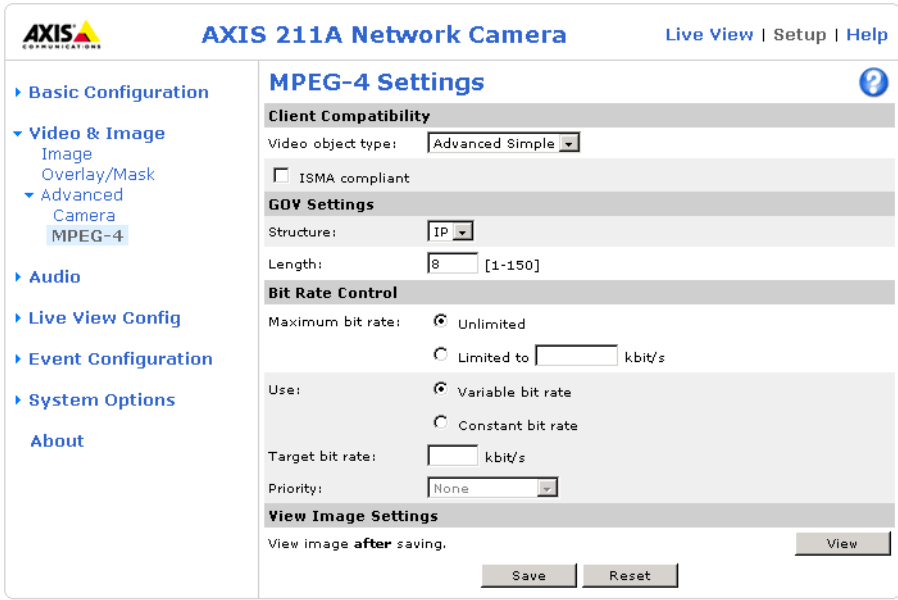

To compensate for the **lighting conditions,** the **white balance** and **exposure control** can be adjusted. If available, **DC-Iris** should always be enabled except during focusing, or when using a non-DC-Iris lens.

The settings for **Low-light behavior** determine how the cameras will behave at low light levels. These settings all affect video image quality and are basically a measure of how much noise to allow in the video images.

Please see the online help for further instructions on these settings.

### MPEG-4 Settings

Tools for adjusting the MPEG-4 settings and for controlling the video bit rate.




The MPEG-4 standard provides many different coding tools for various applications in different situations. As most MPEG-4 clients do not support all of these tools, it is usual to instead define and use subsets for different clients or groups of clients. These settings allow you to define the type of viewing client to use.

Adjusting the maximum bit rate and setting it to variable or constant is a good way of controlling the bandwidth used by the MPEG-4 video stream. For more information on these advanced settings, please see *Video Streams,* on page 13, and the online help.

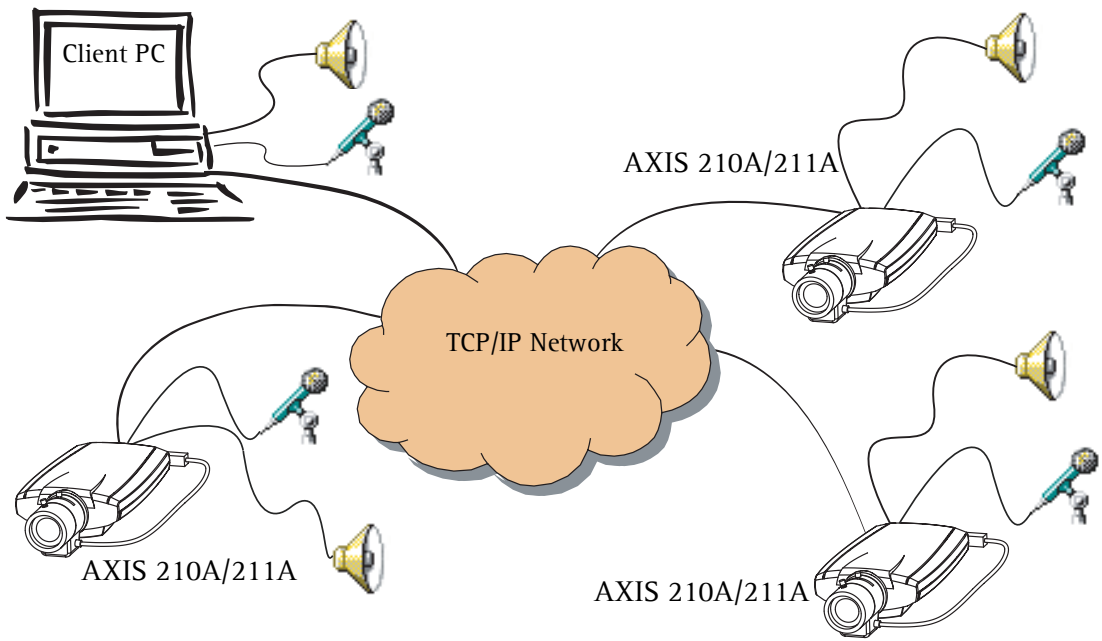
## AXIS Media Control

The AXIS Media Control (AMC) is installed automatically the first time the camera is accessed from a browser. The AMC control panel can be opened by right-clicking on the video image in the Live View web page. The AMC control panel can be used to configure various video and audio settings, such as push-to-talk. Please see the readme file included in the tool for more information.

# Audio (AXIS 210A/211A only)

The AXIS 210A/211A can transmit audio to other clients using an external microphone and can play audio received from other clients by attaching a speaker. The Setup page for the AXIS 210A/211A has an additional menu item called **Audio**, which allows different audio configurations to be set up, e.g. full duplex, half duplex and simplex.

**Note:** The speaker attached to the audio output of the AXIS 210A/211A must have a built-in amplifier, e.g. some PC speakers.




An example of a network using AXIS 210A/211A cameras to transmit audio and video across the network.

## Audio Settings

This section describes how to configure the basic audio settings for the AXIS 210A/211A, e.g. set the communication mode and adjust the sound levels in the microphone and speaker connected to the camera.

### Enable Audio

Check this box to enable audio in the AXIS 210A/211A.

### Audio Channels

There are two mono audio channels between the AXIS 210A/211A and other clients, one for receiving audio and one for transmitting audio. Each audio channel can be turned on or off, which means that there are four **audio mode** options that can be used.

**Full-duplex** mode means you can transmit and receive audio (talk and listen) at the same time, without having to use any of the controls. This is just like having a telephone conversation. The only controls you may wish to use are the mute buttons to turn off the sound, and the sliders, to adjust the input/output volume levels. This mode requires the client PC to have a sound card with full-duplex audio support. If your available bandwidth is 0.2 Mbit/s or less, using **Half-duplex** mode is recommended instead.

**Half-duplex** mode also transmits and receives audio in both directions, but only in one direction at a time. This means that you must select when to receive or transmit audio with the help of the push-to-talk button. To speak, press and hold the button (check that the microphone is not muted). When finished speaking, release the button. You will now be receiving audio from the other end of the connection.

Note that the push-to-talk button is configured from AMC, see *AXIS Media Control,* on page 23. It is also possible to configure the push-to-talk button so that it toggles between speaking and listening modes. Half-Duplex mode is best if you only have limited bandwidth available.

When selecting **Simplex - AXIS 210A/211A speaker only** mode, the speaker connected to the camera will play audio, but no audio will be transmitted from the camera to other web clients. This could be used to e.g. provide spoken instructions to a person seen in the camera. This mode requires you to use the push-to-talk button.

**Simplex - AXIS 210A/211A microphone only** mode transmits audio only from the AXIS 210A/211A to web clients. It will not receive audio from any other web clients. This can be used in remote monitoring, web attractions etc., to provide live audio, as well as video, of a monitored situation.

When using half-duplex, the **Send the sound from the active client to all other clients** option transmits the audio signal from the client that is talking to all the other clients.

### Audio Input

Audio from an external microphone or a line **source** can be connected to the Line/Mic in jack of the AXIS 210A/211A. The audio source can be set to Internal **Microphone, External Microphone** or **Line**. If you are using a microphone, the **input sensitivity** can be set to **High** or **Low**. See *Technical Specifications,* on page 54 for the exact maximum levels.

The **Enable microphone power** option provides DC power for an external microphone. If using a small electret condenser microphone such as a clip-on mic or a PC microphone, this option needs to be enabled.

To use a high impedance dynamic microphone, DC power should not be enabled. DC power will not harm the microphone, but if you are uncertain, try switching it off and on. The default value is DC power enabled. To use a professional microphone requiring 48V phantom power, you need an external power supply and must use a balanced-unbalanced converter (audio transformer) in between.

If there are problems with the sound input being too low or high, adjust the **input gain for the microphone attached to the** AXIS 210A/211A.

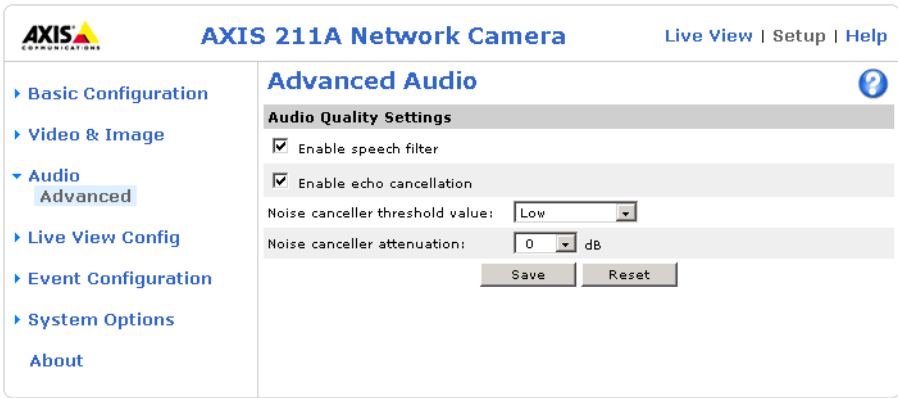
### Audio Output

If the sound from the speaker is too low or high, adjust the **output gain** for the active speaker attached to the AXIS 210A/211A.

When satisfied with the settings, click **Save**, or click **Reset** to revert to the previously saved settings.

## Advanced Audio Settings

The **Audio Quality Settings** allow you to fine-tune the internal or external microphone connected to the AXIS 210A/211A to suit your environment.




**Enable speech filter** improves the sound quality when the microphone is placed close to the person talking and can also help reduce background noise. The filter cuts the lowest and the highest frequencies. The bypass frequency range is approximately 250Hz to 3700Hz (measured at -10dB cut-off break points).

**Enable echo cancelation -** If audio from the speaker is captured by the microphone, this will produce an echo. Enable this option to reduce acoustic echoing.

Noise canceling is a way of reducing the background noise when there is no useful audio present. A typical application could be that the camera is set up in a noisy environment, and you are only interested in hearing the sound from the AXIS 210A/211A when someone is speaking close to the microphone.

There are two adjustable parameters available for noise cancellation:

- **Noise canceller threshold level**
- **Noise canceller attenuation**

When the incoming sound is louder than the threshold it will pass without being affected. When lower than the threshold, the incoming sound will be reduced by a certain attenuation factor. The threshold level should be set higher than the background noise, but lower than the useful audio.

The **noise canceller threshold value** can be set to **High**, **Medium High**, **Medium low** or **Low**. A lower threshold will allow most audio to pass, only the weakest background noise will be reduced. A higher threshold will make the noise canceller act on even stronger background noise. At the maximum level - **High** - there is a risk of reducing useful audio as well.

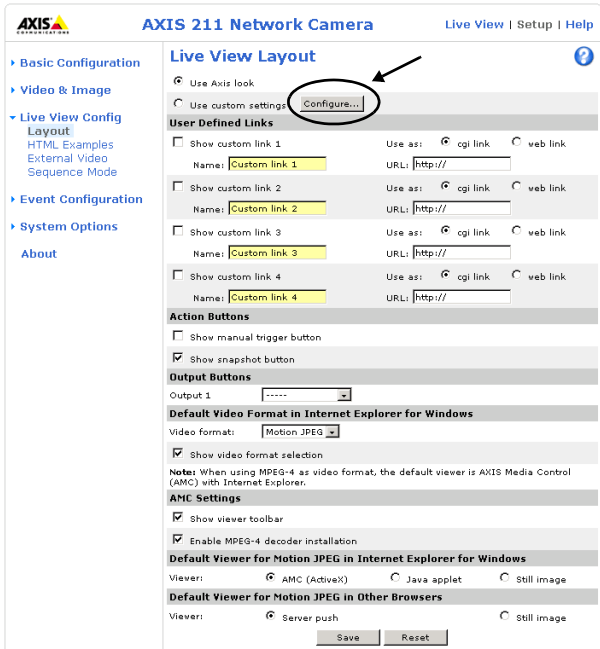
There is thus always a trade-off between noise canceling and sound quality. In other words, increasing the **noise canceller attenuation** results in deterioration in sound quality. To adjust the threshold and attenuation to an optimum level, change the levels and then listen to the result, repeating as necessary.

# Live View Config

These are the tools for deciding the layout of the camera's Live View page. The layout can be set in 3 ways:

- **Use Axis look** - the layout is unchanged.
- **Use custom settings** - modify the default Live View page with your own colors, images etc. Click the **Configure** button and see below.
- **Own Home Page** - Use your own custom page as the default web page. Click the **Configure** button and see the following page.

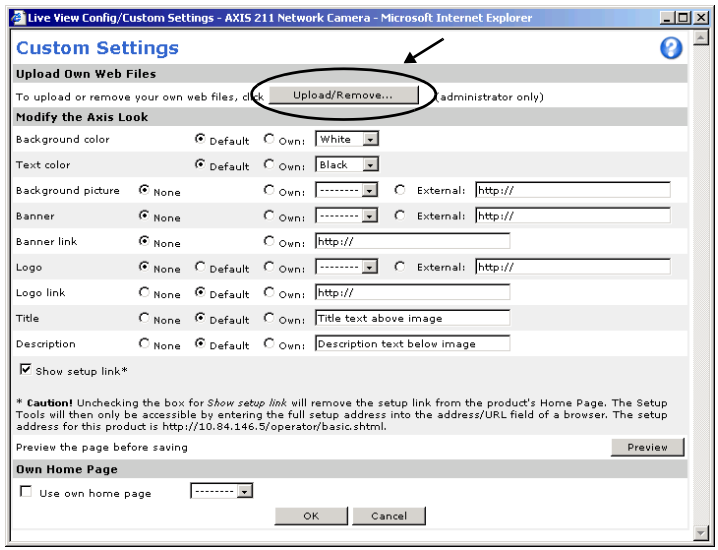
The other settings on this page concern which other features to include, e.g. buttons and links. See page 29 for more information.




## Use custom settings

Adjust the settings under **Modify the Axis look**, to change the background picture, banner, colors, etc.

To use your own file for e.g. a banner, first upload it (see the following page) or select **External** and enter the path to the file.


Live View Config/Custom Settings - AXIS 211 Network Camera - Microsoft Internet Explorer
Custom Settings
Upload Own Web Files
Upload/Remove...
(administrator only)
Modify the Axis Look
Background color
Text color
Background picture
Banner
Banner link
Logo
Logo link
Title
Description
Default Own: White
Default Own: Black
None Own: External: http://
Own: http://
Default Own: Title text above image
Default Own: Description text below image
Show setup link*
* Caution! Unchecking the box for Show setup link will remove the setup link from the product's Home Page. The Setup Tools will then only be accessible by entering the full setup address into the address/URL field of a browser. The setup address for this product is http://10.84.146.5/operator/basic.shtml.
Preview the page before saving
Preview
Own Home Page
Use own home page
OK
Cancel

Note that unchecking the box for **Show setup link** will remove the setup link from the camera's Home Page. The setup tools will then only be accessible by entering the full setup address into the address/URL field of a browser, i.e.

http://<IP address>/operator/basic.shtml

## Upload Own Web Files

Your own background pictures, banners and logos can either be located externally on e.g. a network server, or they can be uploaded to the AXIS 210/210A/211/211A itself. Once uploaded, files are shown in the drop-down lists for **Own** (file). Follow these instructions to upload a file.

1. Click the **Upload/Remove** button in the Custom settings dialog.
2. Enter the path to the file, e.g. a file located on your computer or click the **Browse** button.
3. Select the user level for the uploaded file. Setting the user access level means that you have complete control over which pages can be viewed by which users.
4. When the path is shown correctly in the text field, click the **Upload** button.

All uploaded files are shown in the list in the lower section of this dialog. To remove a file, check the box provided next to it and then click the **Remove** button.

**Note:** To use your own logo in the camera's web pages. this must be added as a gif file, and the file name must be in lower case. E.g. mylogo.gif

## Own home page

From Live View Layout, select the radio button **Use custom settings** and click **Configure**.

Check the box **Use own home page** at the bottom of this dialog, To use a previously uploaded web page (see above) as the default home page, select the page from the drop-down list and click OK.

## User-defined Links

Enter a descriptive name and enter the URL in the provided field.

### Example

1. Check **Show Custom Link 1**
2. Enter a descriptive name, e.g. **My Website**
3. Check the radio button for **web link.**
4. Enter the web link: e.g. http://www.example.com
5. Click **Save.**

This link will then be shown on the Live View page and will open the specified website.

User-defined CGI links can be used to issue advanced commands via the Axis HTTP API. For more information, see the Developer pages at www.axis.com/developer

### Action Buttons

The manual trigger buttons can be used to manually trigger and stop an event from the Live View page. See *Event Configuration,* on page 32.

Enabling the display of the **Snapshot** button allows users to save a snapshot from the video stream by clicking the button. This button is mainly intended for use with browsers other than Internet Explorer, or when otherwise not using AXIS Media Control (AMC) to view the video stream. AMC (an ActiveX control) for Internet Explorer provides its own snapshot button.

### Output Buttons

These buttons can then be used to manually activate the output from the Live View page, e.g. to switch a light on and off. There are 2 options for how the output is activated:

- The Pulse button activates the output for a defined period
- Active/Inactive displays 2 buttons, one for each action (on/off)

### Default Video Format in Internet Explorer for Windows

Select the default format to use on the Live View page. Checking the box for **Show video format selection** displays a drop-down list on the Live View page allowing you to temporarily change the format.

When using MPEG-4 as the video format, the default viewer is AXIS Media Control with Internet Explorer.

**Note:** It is also possible to view Motion JPEG when MPEG-4 is chosen as default and vice versa.

### AMC (AXIS Media Control) Settings

Checking the **Show viewer toolbar box** displays the AMC toolbar under the video stream.

By checking the **Enable MPEG-4 decoder installation** box, it is also possible for the Administrator to enable or disable the installation of the MPEG-4 decoder. This is used to prevent the installation of unlicensed copies. Further decoder licenses can be purchased from your Axis dealer. See also *AXIS Media Control,* on page 23.

### Default Viewer for Motion JPEG

Select the appropriate radio button to define the method for viewing moving video images, depending on your browser and settings.

Please see the online help for more information.

## HTML Examples

You can add live video from the cameras to your own web site. The camera can transmit a Motion JPEG or unicast MPEG-4 stream to up to 20 simultaneous connections, although an administrator can restrict this to fewer. If multicast MPEG-4 is used, the video stream will be available to an unlimited number of viewers connected to the parts of the network where multicast is enabled. Please note that a separate MPEG-4 license is required for each viewer.

Enter the **Video Format**, **Image Type**, **Image size** and other settings to suit your Web page and click **Update**. The camera then generates the required source code for your configuration. Copy this code and paste it into your own Web page code.

## External Video

The cameras can also display video images from other Axis network cameras and video servers, directly on the Live View page. These are known as **External Video** sources. These external video sources are available from the drop-down list on the Live View page.

Click the **Add** button to open the External Video Source Setup dialog, which is used to make all the necessary settings. Enter the IP address or host name of the external video source you wish to add. Depending on the external source, then select either MPEG-2, MPEG-4 or Motion JPEG as the type of video stream to receive.

Example of a path to an external video source:

```
http://192.168.0.125/axis-cgi/mjpeg/video.cgi
```

## Sequence Mode

The Live View page can be configured to rotate through the internal and selected external video sources, in order, or randomly.

Select the desired video sources and enter the time in seconds to display each source (up to 59 minutes). Click **Save**.

The Sequence buttons will appear on the Live View page to enable the viewer to start and stop the sequence mode.

Please see the online help for more information.

# Event Configuration

An **event** in the camera is when an **Event Type** is activated and causes certain actions to be performed. The event type is the set of parameters (or conditions) that specifies how and when which actions will be performed. A common event type is when the camera uploads images when an alarm occurs. Many event types use an **Event Server**, to e.g. upload images to.

This section describes how to set up event servers and event types, i.e. how to configure the cameras to perform certain actions when events (e.g. alarms) occur.

### Definitions

| | | |
|---|---|---|
| **Event type** | A set of parameters describing how and when the camera will perform certain actions | |
| **Triggered Event - see page 33** | The circumstances that start an event. | E.g. on a signal from an external device, such as a door switch or a motion sensor. |
| **Scheduled Event - see page 34** | The circumstances that start an event. | E.g. at a pre-programmed time. |
| **Action** | What occurs when the event triggers. | E.g. the upload of images to an FTP server, email notification, etc. |

## Event Servers

Event Servers are used to receive e.g. uploaded image files and/or notification messages. To set up Event server connections in your cameras, go to **Setup > Event Configuration > Event Servers** and enter the required information for the required server type.

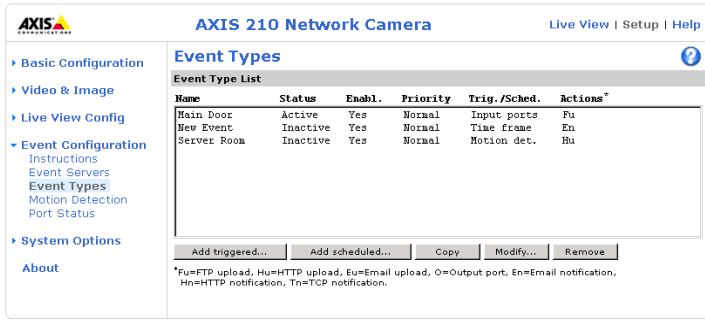
| Server type | Purpose | Information required |
|---|---|---|
| **FTP Server** | • Receives uploaded images | • Descriptive name of your choice<br>• Network address (IP address or host name)<br>• User Name and Password (for FTP server)<br>• Upload path e.g. images/<br>• Port number<br>• Use passive mode if there is a firewall between the camera and FTP server |
| **HTTP Server** | • Receives notification messages<br>• Receives uploaded images | • Descriptive name of your choice<br>• URL (IP address or host name)<br>• User Name and Password (for HTTP server)<br>• Proxy address/Proxy port (if required)<br>• Proxy User Name and Password (if required) |
| **TCP Server** | • Receives notification messages | • Descriptive name of your choice<br>• Network address (IP address or host name)<br>• User Name and Password (for TCP server)<br>• Port number |

For details on each setting, please see the online help  available from each web page.

When the setup is complete, the connection can be tested by clicking the **Test** button (the connection test takes approximately 10 seconds).

# Configuring Event Types

An **Event Type** describes how and when the camera will perform certain actions.




**Example:** If somebody passes in front of the camera and an event that uses motion detection has been configured to act on this, the camera can e.g. record and save images to an FTP server, and/or send a notification email to a pre-configured email address with a pre-configured message. Images can be sent as email attachments.

### Triggered Event

A Triggered event can be activated by e.g:

- a push button connected to the camera's input port
- detected movement in a configured motion detection window
- a manually activated action, e.g. from an action button in the web interface
- on restart (reboot) after e.g. power loss

### How to set up a triggered event

This example describes how to set up the camera to upload images when e.g the main door is opened:

1. Click **Add triggered** on the **Event types** page.
2. Enter a descriptive **name** for the event, e.g. Main door open.
3. Set the **priority** - High, Normal or Low (see the online help).
4. Set the **Respond to Trigger...** parameters for when the event will be active, e.g. only after office hours.
5. Select the trigger alternative from the **Triggered by...** drop-down list, e.g. select Input ports, for a sensor connected to the door.
6. Set the **When Triggered...** parameters, i.e. define what the camera will do if the main door is opened e.g., upload images to an FTP server.
7. Click **OK** to save the Event in the Event Types list.

Please see the online help for descriptions of each available option.

**Note:** Up to 10 event types can be configured in the cameras, and up to 3 of these can be configured to upload images.

### Pre-trigger and Post-trigger buffers

This function is very useful when checking to see what happened immediately before and/or after a trigger, e.g. 30 seconds before and/or after a door was opened. Check the **Upload images** checkbox under **Event Types > Add Triggered... > Triggered by...** to expand the web page with the available options. All uploaded images are JPEG images.

**Include pre-trigger buffer** - images stored internally in the server from the time immediately preceding the trigger. Check the box to enable the pre-trigger buffer, enter the desired length of time and specify the required image frequency.

**Include post-trigger buffer** - contains images from the time immediately after the trigger. Configure as for pre-trigger.

**Notes:**
- Pre-trigger and Post-trigger buffers will be lost if the connection to the event server fails.
- The maximum length of the pre-/post-buffer depends on the video image size and selected frame rate.
- If the pre- or post-buffer is too large for the camera's internal memory, the frame rate will be reduced and individual images may be missing. If this occurs, an entry will be created in the unit's log file.

**Continue image upload (unbuffered)** - enables the upload of video images for a fixed length of time. Specify the length of time for the uploaded recording, in seconds, minutes or hours, or for as long as the trigger is active. Finally, set the desired image frequency to the maximum (the maximum available) or to a specified frame rate. The frame rate will be the best possible, but might not be as high as specified, especially if uploading via a slow connection.

### Scheduled Event

A **Scheduled event** can be activated at preset times, in a repeating pattern on selected weekdays.

### Configuration example:

1. Click **Add scheduled** on the **Event types** page.
2. Enter a descriptive **name** for the event, e.g. “Scheduled email upload.”
3. Set the **priority** (High, Normal or Low).
4. Set the **Activation Time** parameters (24h clock) when the event will be active, e.g. start on Sundays at 13.00 with a duration of 12 hours.
5. Set the **When Activated...** parameters, i.e. set what the camera will do at the specified time, e.g. send uploaded images to an email address.
6. Click **OK** to save the Event in the Event Types list.

Please see the online help for descriptions of each available option.

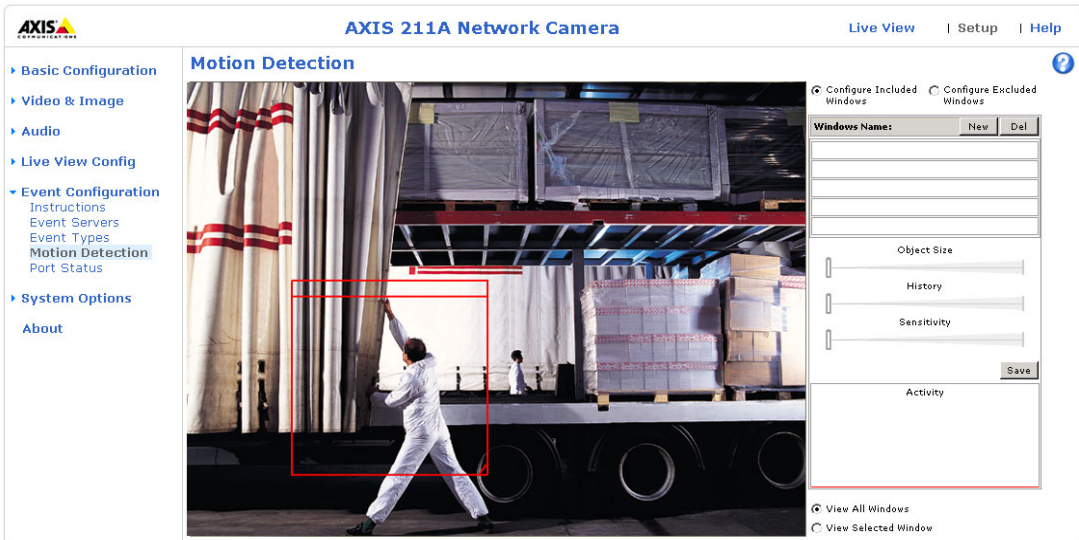
## Motion Detection

Motion detection is used to generate an alarm whenever movement occurs (or stops) in the video image. A total of 10 Include and/or Exclude windows can be configured.

- **Included** windows target specific areas within the whole video image
- **Excluded** windows define areas within an Include window that should be ignored (areas outside Include windows are automatically ignored)

Once configured, the motion detection windows will appear in the list of available triggers, for triggering events. See *How to set up a triggered event* above.

**Note:** Using the motion detection feature may decrease the camera's overall performance.




### Configuring Motion Detection

1. Click **Motion Detection** in the **Event Configuration** menu.
2. Click the **Configure Included Window** radio button.
3. Click **New**.
4. Enter a descriptive name under **Window name**.
5. Adjust the size (drag the bottom right-hand corner) and position (click on the text at the top and drag to the desired position).
6. Adjust the Object size, History and Sensitivity profile sliders (see table below for details). Any detected motion within an active window is then indicated by red peaks in the **Activity** window (the active window has a red frame).
7. Click **Save**.

> To exclude parts of the Include window, click the **Configure Excluded Windows** button and position the Exclude window as required, within the Include window.

Please see the online help for descriptions of each available option.

| | Object Size | History | Sensitivity |
|---|---|---|---|
| High level | Only very large objects trigger motion detection | An object that appears in the region will trigger the motion detection for a long period | Ordinary colored objects on ordinary backgrounds will trigger the motion detection |
| Low level | Even very small objects trigger motion detection | An object that appears in the region will trigger motion detection for only a very short period | Only very bright objects on a dark background will trigger motion detection |
| Default value | Low | Medium to High | Medium to High |

**Examples:**

- Avoid triggering on small objects in the video image by setting the **object size** level to high.
- To reduce the number of triggers if there is a lot of movement during a short period of time, select a high history level.
- To only detect flashing light, low **sensitivity** can be selected. In other cases, a high **sensitivity** level is recommended.

## Port Status

Under **Event Configuration > Port Status** there is a list showing the status for the cameras's input and output. This is for the benefit of **Operators**, who have no access to the System Options section.

**Example:** If the Normal state for a push button connected to an input is set to **Open circuit –** as long as the button is not pushed, the state is **inactive**. If the button is pushed, the state of the input changes to **active**.

# System Options

## Security

User access control is enabled by default, when the administrator sets the root password on first access. An administrator can set up other users, by giving these user names and passwords. It is also possible to allow anonymous viewer login, which means that anybody may access the Live View page, as described below:

**Users** - the **user list** displays the authorized users and user groups (levels):

| | |
|---|---|
| Viewer | Provides the lowest level of access, which only allows access to the Live View page. |
| Operator | An operator can view the Live View page, create and modify event types and adjust certain other settings. Operators have no access to the System Options. |
| Administrator | An administrator has unrestricted access to all the setup tools and can determine the registration of all other users. |

**User Settings** - check the relevant checkboxes to enable:

- **Anonymous viewer login** - allows any viewer direct access to the Live View page.
- **Maximum number of simultaneous viewers** - enter a value here to restrict the number of unicast viewers accessing the unit. This is useful if you need to save on bandwidth. (Note that all multicast viewers count as 1 viewer.)

### IP Address Filtering

Checking the **Enable IP address filtering** box enables the IP address filtering function. Up to 256 IP address entries may be specified (a single entry can contain multiple IP addresses). Click the **Add** button to add new filtered addresses.

When the IP address filter is enabled, addresses added to the list are set as allowed **or** denied addresses. All other IP addresses not in this list will then be allowed or denied access accordingly, i.e. if the addresses in the list are allowed, then all others are denied access, and vice versa. See also the online help for more information.

Note that users from IP addresses that will be allowed must also be registered as users. This is done from **Setup > System Options > Security > Users**.

### Referrals

to prevent unauthorized clients from including the video stream from the cameras into external Web pages, check the **Referrals** checkbox and enter the IP address or Host name of the computer that hosts the Web pages with the included video stream. Several IP addresses/host names can be defined and are separated by semicolons (;). This option is only applicable to Motion JPEG video streams.

**Notes:**
- If the referrals feature is enabled and you wish to also allow normal access to the Live View page, the product's own IP address or host name must be added to the list of allowed referrers.
- Restricting referrers has no effect on an MPEG-4 video stream. To restrict an MPEG-4 stream, IP address filtering must be enabled.
- Restricting referrers is of greatest value when not using IP address filtering. If IP address filtering is used, then the allowed referrers are automatically restricted to those allowed IP addresses.

## HTTPS (AXIS 210A/211A only)

The AXIS 210A and the AXIS 211A both support encrypted browsing using HTTPS.

A **self-signed certificate** can be used until a Certificate Authority-issued certificate has been obtained. Click the **Create self-signed Certificate** button to install a self-signed certificate. Although self-signed certificates are free and offer some protection, true security will only be implemented after the installation of a signed certificate issued by a certificate authority.

A signed certificate can be obtained from an issuing Certificate Authority by clicking the **Create Certificate Request** button. When the signed certificate is returned, click the **Install signed certificate** button to import the certificate. The properties of any certificate request currently resident in the camera or installed can also be viewed by clicking the **Properties...** button. The HTTPS Connection Policy must also be set in the drop-down lists to enable HTTPS in the camera.

For more information, please refer to the online help.

## Date & Time

**Current Server Time** - displays the current date and time (24h clock). The time can be displayed in 12h clock format in the Overlay Images (see below).

**New Server Time** - Select your time zone from the drop-down list. If you want the server clock to automatically adjust for daylight savings time, select the **Automatically adjust for daylight saving time changes.**

From the **Time Mode** section, select the preferred method to use for setting the time:

- **Synchronize with computer time** - sets the time from the clock on your computer.
- **Synchronize with NTP Server** - the camera will obtain the time from an NTP server every 60 minutes. The **NTP server**'s IP address or host name must be specified in the **TCP/IP Advanced Settings** - see page 40.
- **Set manually** - this option allows you to manually set the time and date.

**Note:** Note that if using a host name for the NTP server, a DNS server must be configured under **TCP/IP** settings. See **Network > TCP/IP** below.

**Date & Time Format Used in Images** - specify the formats for the date and time (12h or 24h) displayed in the Live View video streams.

Use the predefined formats or use your own custom date and time formats. See **Advanced File Naming & Date/Time Formats** in the help files for information on how to create your own file formats.

## Network - Basic TCP/IP Settings

### IP Address Configuration

The camera's IP address can be set automatically via DHCP, or a fixed IP address can be set manually. A host name can be used and there are options for setting up notification of changes in the IP address. DHCP is enabled by default.

**Notes:**
- DHCP is a protocol for automatic IP address assignment on a network. IP address assignment via DHCP may lead to the situation where the IP address changes and you lose contact. Configure the options for notification of IP address change (under Services) to receive notification from the video server when the IP address changes.
- Alternatively, if your DHCP server can update a DNS server, you can access the AXIS 210/210A/211/211A by host name which is always the same, regardless of the IP address.

### Services

**Options for notification of IP address change** - if the IP address for the video server changes, e.g. automatically by DHCP, you can choose to be notified of the change. Click **Settings...** and enter the required information.

**AXIS Internet Dynamic DNS Service** - The AXIS Internet Dynamic DNS Service can provide your Axis product with its own URL (web address), which can then be used to access it over the Internet. The product can be unregistered from the service at any time. To do this click Settings... and follow the instructions. For more information, please refer to the online help.

## Network - Advanced TCP/IP Settings

### DNS Configuration

DNS (Domain Name Service) provides the translation of host names to IP addresses on your network.

**Obtain DNS server address via DHCP** - automatically use the DNS server settings provided by the DHCP server. Click the View button to see the current settings.

**Use the following DNS server address** - enter the desired DNS server by specifying the following:

**Domain name** - enter the domain(s) to search for the host name used by the AXIS 210/210A/211/211A. Multiple domains can be separated by semicolons (;). The host name is always the first part of a Fully Qualified Domain Name, e.g. **myserver** is the host name in the Fully Qualified Domain Name **myserver.mycompany.com** where mycompany.com is the Domain name.

**DNS servers** - enter the IP addresses of the primary and secondary DNS servers.

### NTP Configuration

The AXIS 210/210A/211/211A can obtain the correct time from an NTP server. The address for the NTP server can either be obtained via the DHCP server, or it can be entered manually.

### Host Name Configuration

The AXIS 210/210A/211/211A can be accessed using a host name, instead of an IP address. The host name is usually the same as the assigned DNS Name.

For more information, please see the online help

### Link-Local Address

This is enabled by default and assigns the AXIS 210/210A/211/211A an additional IP address for use with UPnP™. The AXIS 210/210A/211/211A can have both a Link-Local IP and a static/DHCP-supplied IP address at the same time - these will not affect each other.

### HTTP

The default HTTP port number (80) can be changed to any port within the range 1024-65535. This is useful for e.g. simple security port mapping.

### HTTPS (AXIS 210A/211A only)

The default HTTPS port number (443) can be changed to any port within the range 1024-65535. HTTPS is used to provide encrypted web browsing.

### NAT Traversal

Use NAT traversal when your AXIS 210/210A/211/211A is located on an intranet (LAN) and you wish to make it available from the other (WAN) side of a NAT router. With NAT traversal properly configured, all HTTP traffic to an external HTTP port in the NAT router will be forwarded to the network camera.

**Enable/Disable** - When enabled, the AXIS 210/210A/211/211A will attempt to configure port mapping in a NAT router on your network, using UPnP™.

**Use manually selected NAT router** - Select this option to manually select a NAT router. Enter the IP address for the router in the field provided.

If a router is not manually specified, the AXIS 211A Network Camera will automatically search for NAT routers on your network. If more than one router is found, the default router will be selected

**Alternative HTTP port** - Select this option to manually define an external HTTP port. Enter the port number in the field provided. If no port is entered here a port number will automatically be selected when NAT traversal is enabled.

For more information, please see the online help

### RTSP

The RTSP protocol allows a connecting client to start an MPEG-4 stream. Enter the RTSP port number to use. The default setting is 554.

### Network Traffic

The default setting is **Auto-negotiate** which means that the correct speed is automatically selected. If necessary, you can set the connection speed by selecting it from the drop-down list.

**Maximum bandwidth** - Specify, in Mbit/s or kbit/s, the maximum bandwidth the AXIS 210/210A/211/211A will be allowed to use on your network. This is a useful function when connecting the camera to busy or heavily loaded networks. The default setting is **Unlimited**.

**Note:** When using MPEG-4 as the video format, remember that setting a maximum bandwidth value here may create problems for individual video streams if the maximum value is less than the sum of the bit rates set for the video streams.

For more information, please see the online help.

## Network - SOCKS

SOCKS is a network proxy protocol. The cameras can be configured to use a SOCKS server to reach networks on the other side of a firewall/proxy server. This functionality is useful if the camera is located on a local network behind a firewall, but notifications, uploads, alarms, etc., need to be sent to a destination outside the local network (e.g. to the Internet).

## Network - SMTP (email)

Enter the host names or addresses for your primary and secondary mail servers in the fields provided, to enable the sending of event and error email messages from the camera to predefined addresses via SMTP.

## Network - SNMP (AXIS 210A/211A only)

The Simple Network Management Protocol (SNMP) allows the remote management of network devices. Select the version of SNMP to use, depending on the level of security required. HTTPS should be enabled when setting the password for SNMPv3.

## Network - UPnP™

The cameras includes support for UPnP™, which is enabled by default. If also enabled on your computer, the camera will automatically be detected and a new icon will be added to "My Network Places."

**Note:** UPnP must also be enabled on your Windows XP or ME computer. To do this, open the Control Panel from the **Start Menu** and select **Add/Remove Programs**. Select **Add/Remove Windows Components** and open the **Networking Services** section. Click **Details** and then select **UPnP** as the service to add.

## Network - RTP / MPEG-4

These settings are for the IP addresses, port numbers, and Time-To-Live values to use for media streams in the MPEG-4 format. Only certain IP addresses and port numbers should be used for these streams. For more information, please see the online help.

## Ports & Devices

**I/O Ports** - the pinout, interface support and the control and monitoring functions provided by this connector are described in *The I/O Terminal Connector*, on page 46.

## LED Settings

The Status indicator LED on the front of the camera can be set to flash at a configurable interval (or to not light up at all) whenever the unit is accessed. For a listing of all LED behavior, see page 8, or the online help.

**Note:** The LED does not flash when the stream is retrieved using MPEG-4 multicast.

## Maintenance

- **Restart** - The camera is restarted without changing any of the settings. Use this method if the unit is not behaving as expected.
- **Restore** - The unit is restarted and most current settings are reset to factory default values. The settings that will not be reset are as follows:
  - the boot protocol (DHCP or static)
  - the static IP address
  - the default router
  - the subnet mask
  - the system time
- **Default** - The default button should be used with caution. Pressing this will return **all** of the camera's settings (including the IP address) to the factory default values.

**Upgrade Server** - See *Upgrading the Firmware*, on page 48.

**Backup** - To take a backup of all of the parameters, and any user-defined scripts, click this button. If necessary, it will then be possible to return to the previous settings, if settings are changed and there is unexpected behavior.

**Restore** - click the **Browse** button to locate the saved backup file (see above) and then click the **Restore** button. The settings will be restored to the previous configuration.

**Note:** **Backup** and **Restore** can only be used on the same unit running the same firmware. This feature is not intended for the configuration of multiple units or for firmware upgrades.

## Support

The **support overview** page provides valuable information on troubleshooting and contact information, should you require technical assistance.

System overview

**Logs & Reports** - when contacting Axis support, please be sure to provide a valid Server Report with your query.

**View Information** - The **Log file,** the **Server Report** and the **Parameter List** all provide valuable information for troubleshooting and when contacting Axis support.

**Configuration**

**Log Level for Log Files** - from the drop-down list, select the level of information to be added to the Log file

**Log Level for Email** - from the drop-down list, select the level of information to send as email and enter the destination email address.

## Advanced

Scripting is an advanced function that provides the means for customizing and using scripts.

**Caution!**

The scripting function is a very powerful tool. Improper use may cause unexpected behavior or even loss of contact with the unit. If a script does cause problems, reset the unit to its factory default settings (in which case, a previously saved backup file will be useful for returning the unit to its latest configuration). **Axis strongly recommends that you do not use this function unless you fully understand the consequences.** Axis support provides no assistance for customized scripts.

For more information, please visit the Developer pages at www.axis.com/developer

**Plain Config** - this function is for the advanced user with previous experience of configuring Axis cameras. All parameters can be set and modified from this page. Help is available via the links on the standard setup pages.

## Resetting to the Factory Default Settings

To reset the cameras to the original factory default settings, go to the **System Options > Maintenance** web page (as described in *Maintenance,* on page 43) or use the **Control button** on the underside of the camera (see page 7) as described below:

### Using the Control Button

To reset the cameras to the factory default settings using the Control Button:

1. Disconnect the power adapter, or the network cable if using PoE (AXIS 210A/AXIS 211/211A only).
2. Press and hold the Control button while reconnecting the power.
3. Keep the Control button pressed until the **Status Indicator** color changes to amber (this may take up to 15 seconds).
4. Release the Control button.
5. When the Status Indicator changes to Green (which may take up to 1 minute), the process is complete and the cameras has been reset. The unit will now have the default IP address 192.168.0.90

# The I/O Terminal Connector

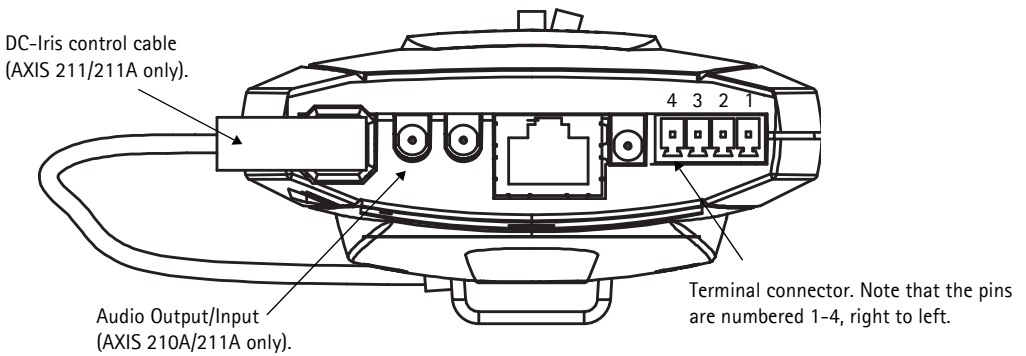
## Pinout and Interface

The 4-pin I/O terminal connector provides the interface to:

- 1 transistor output
- 1 digital input
- auxiliary power and GND

The terminal connector is used in applications for e.g. motion detection, event triggering, time lapse recording, alarm notification via email, image storage to FTP locations, etc.

- **Input** - for connecting e.g. a push button. If the push button is pressed, the **state** changes and the input becomes active (shown under **Event Configuration > Port Status**).
- **Output** - connects e.g. an alarm device that can be activated by Output buttons on the **Live View** page, or by an **Event Type**. The output will show as **active** (**Event Configuration > Port Status**) if the alarm device is activated.

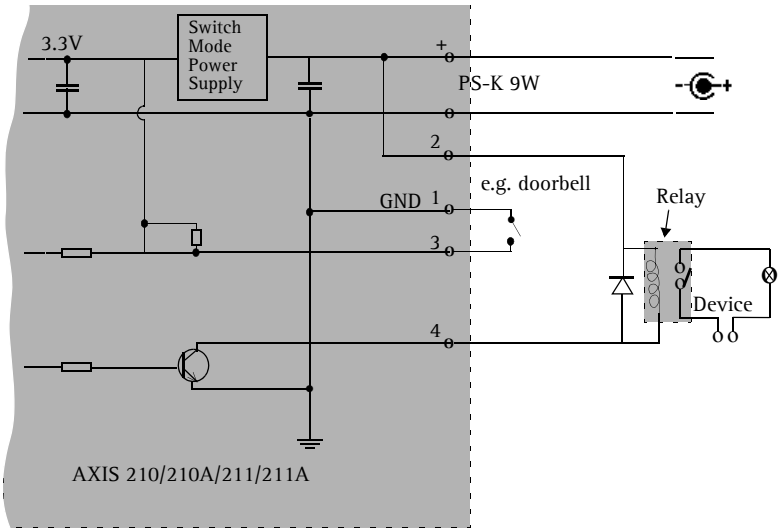



| Pin | Function | Description |
|---|---|---|
| 4 | Transistor Output | With a maximum load of 100mA and a maximum voltage of 24V DC, this output has an open-collector NPN transistor with the emitter connected to pin 1 (GND). If used with an external relay, a diode must be connected in parallel with the load, for protection against voltage transients. |
| 3 | Digital Input | Connect to GND to activate, or leave floating (or unconnected) to deactivate. |
| 2 | Auxiliary DC Power Input | 7-20 VDC/min 7W. Electrically connected in parallel with the PS-K power connector, this pin provides an auxiliary connector for mains power to the unit. If the unit is powered via this pin, a fuse should be used (rating: 1A Slow). This pin can also be used to power auxiliary equipment, max 100mA, but note that this is not possible when the AXIS 210A/AXIS 211/211A is powered by PoE. |
| 1 | GND | |

Connect input/output devices to the terminal connector as follows:

1. Loosen the corresponding screw on top of the pin (see above for the correct pin to use).
2. Push the cable into the connector and secure it by fastening the screw.
3. Once devices are connected, connect the terminal connector to the camera, making sure that all cables are securely fastened.

### Schematic Diagram – Terminal Connectors



# Troubleshooting

## Checking the Firmware

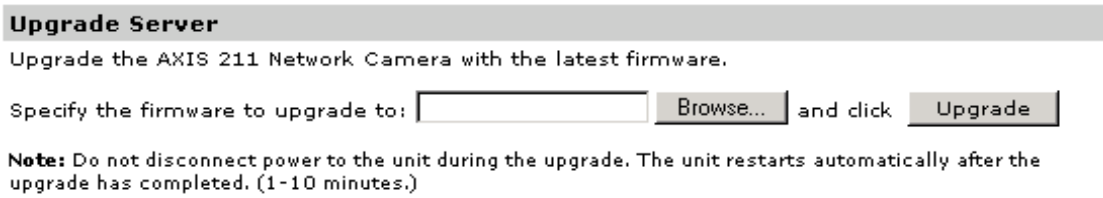
One of your first actions when troubleshooting a problem should be to check the currently installed firmware version. The latest version may contain a correction that fixes your particular problem. The current firmware version in your camera can be seen on the page **Setup > Basic Configuration.**

## Upgrading the Firmware

Firmware is software that determines the functionality of the camera. When you upgrade the firmware with a file from the Axis Web site, your camera will receive the latest available functionality. Always read the upgrade instructions and release notes available with each new release, before updating the firmware.

**Note:** Preconfigured and customized settings will be saved when the firmware is upgraded (providing the features are available in the new firmware) although this is not guaranteed by Axis Communications. Always read the instructions and release notes available with each new release, before upgrading the firmware.

1. Save the firmware file to your computer. The latest version of the firmware is available free of charge from the Axis Web site at **www.axis.com/techsup**
2. Go to **Setup > System Options > Maintenance** in the camera's web pages.
3. In the **Upgrade Server** section, browse to the desired firmware file on your computer. Click **Upgrade.**


Upgrade Server
Upgrade the AXIS 211 Network Camera with the latest firmware.
Specify the firmware to upgrade to:
Browse...
and click
Upgrade
Note: Do not disconnect power to the unit during the upgrade. The unit restarts automatically after the upgrade has completed. (1-10 minutes.)

**Notes:**
- After starting the upgrade process, always wait at least 5-10 minutes before restarting the camera, even if you suspect the upgrade has failed.
- Your dealer reserves the right to charge for any repair attributable to faulty upgrading by the user.

## Emergency Recovery Procedure

If power or the network connection to the camera is lost during the upgrade, the process will fail and the unit will become unresponsive. A flashing red Status LED indicates a failed upgrade. To recover the unit, follow the steps below. The serial number is found on the label attached to the bottom of the camera.

1. **Unix/Linux** - From the command line, type the following:
   arp -s <IP address of camera> <Serial number> temp
   ping -s 408 <IP address of camera>

   **Windows** - From a command/DOS prompt, type the following:
   arp -s <IP address of camera> <Serial number>
   ping -l 408 -t <IP address of camera>

2. If the unit does not reply within a few seconds, restart it and wait for a reply. Press CTRL+C to stop Ping.
3. Open a browser and type in the camera's IP address. In the page that appears, use the **Browse** button to select the upgrade file to use, e.g. axis210.bin or axis211.bin. Then click the Load button to restart the upgrade process.
4. After the upgrade has completed (1-10 minutes), the unit will automatically restart and show a steady green on the Power and Status LEDs and flashing green or amber on the Network LED.
5. Referring to the installation guide, reinstall the camera.

If the emergency recovery procedure does not get the camera up and running again, please contact Axis support at www.axis.com/techsup/

## Axis Support

If you contact Axis support, please help us to help you solve your problems, by providing the server report, the log file and a brief description of the problem.

**Server Report** - go to **Setup > System Options > Support Overview**. The server report contains important information about the server and its software, as well as a list of the current parameters.

The **Log file** is available from **Setup > System Options > Logs & Reports**. The Log file records events in the unit since the last system restart and can be a useful diagnostic tool when troubleshooting.

## Symptoms, Possible Causes and Remedial Actions

**Problems setting the IP address**

| | |
|---|---|
| When using ARP/Ping. | Try the installation again. The IP address must be set within two minutes after power has been applied to the camera. Ensure the Ping length is set to 408. See the Installation Guide. |
| The camera is located on a different subnet. | If the IP address intended for the camera and the IP address of your computer are located on different subnets, you will not be able to set the IP address. Contact your network administrator to obtain an appropriate IP address. |
| The IP address is being used by another device | Disconnect the camera from the network. Run the Ping command. (In a Command/DOS window, type **ping** and the **IP address** of the unit).<br>If you receive: **Reply from <IP address>: bytes = 32; time = 10 ms.....** - this means that the IP address may already be in use by another device on your network. You must obtain a new IP address and reinstall the unit.<br>If you see: **Request timed out** - this means that the IP address is available for use with your camera. In this case, check all cabling and reinstall the unit. |
| Possible IP address conflict with another device on the same subnet. | The static IP address in the camera is used before the DHCP server sets a a dynamic address. This means that if the same default static IP address is also used by another device, there may be problems accessing the camera. To avoid this, set the static IP address to 0.0.0.0. |

**The camera cannot be accessed from a browser**

| | |
|---|---|
| The IP address has been changed by DHCP. | 1) Move the camera to an isolated network or to one with no DHCP or BOOTP server. Set the IP address again, using the AXIS IP Utility (see the Installation Guide) or the ARP/Ping commands.<br>2) Access the unit and disable DHCP in the TCP/IP settings. Return the unit to the main network. The unit now has a fixed IP address that will not change.<br>3) As an alternative to 2), if dynamic IP address via DHCP or BOOTP is required, select the required service and then configure IP address change notification from the network settings. Return the unit to the main network. The unit will now have a dynamic IP address, but will notify you if the address changes. |
| Proxy server. | If using a proxy server, try disabling the proxy setting in your browser. |
| Other networking problems. | Test the network cable and connectors by connecting it to another network device, then Ping that device from your workstation. See the instructions above. |
| Cannot log in. | When HTTPS (AXIS 210A/211A only) is enabled, ensure that the correct protocol (HTTP or HTTPS) is used when attempting to log in. You may need to manually type in http or https in the browser's address bar. |
| Incorrect host name. | Check that the host name and DNS server settings are correct. See the basic and advanced TCP/IP settings. |

**Cannot send notifications, uploads, alarms, etc, to a destination outside the local network**

| | |
|---|---|
| Firewall protection. | The camera can be configured to use a SOCKS server to reach networks on the other side of a firewall/proxy server. |

**Camera is accessible locally, but not externally**

| | |
|---|---|
| Firewall protection. | Check the Internet firewall with your system administrator. |
| Default routers required. | Check if you need to configure the default router settings. |

**Poor or intermittent network connection.**

| | |
|---|---|
| Network switch. | If using a network switch, check that the port on that device uses the same setting for the network connection type (speed/duplex) as set in the advanced TCP/IP settings.<br>The Auto-Negotiate setting is recommended. |

**Video/Image problems – general**

| | |
|---|---|
| No images in browser (*Internet Explorer only*) | To enable the updating of video images in Microsoft Internet Explorer, set your browser to allow ActiveX controls. Also, make sure that AXIS Media Control (AMC) component is installed on your workstation. |
| Installation of additional ActiveX component restricted or prohibited. | Configure your camera to use a Java applet for updating the video images under Live View Config > Layout > Default Viewer for Internet Explorer. See the online help for more information. |
| Image too dark or too light. | Check the video image settings. See the online help on Video and Image Settings. |
| Missing images in uploads. | This can occur when trying to use a larger image buffer than is actually available. Try lowering the frame rate or the upload period. |
| Slow image update. | Configuring, e.g. pre-buffers, motion detection, high-resolution images, high frame rates, etc, will reduce the performance of the camera. |
| Poor performance. | Poor performance may be caused by e.g. heavy network traffic, multiple users accessing the unit, low performance clients, use of features such as Motion Detection, Event handling, Image rotation other than 180 degrees. |
| Image gradually gets darker or lighter. | When using the camera in locations lit by fluorescent lighting, check in the advanced image settings that the Exposure control is set to **Flicker-free**. |
| Image loses focus often. | Disable the DC-Iris lens (AXIS 211/211A only) in the settings for **Video & Image > Advanced**. Focus the camera following the instructions on page 9, and then enable the DC-Iris lens. |
| Images only shown in black & white. | Check the color level setting.<br>Check the setting for the IR cut filter. Images are shown in color only when this filter is enabled, i.e. when set to yes or auto. |
| Blurred images. | Refocus the camera. Check in the Video & Image > Advanced - Camera Settings that DC-Iris (AXIS 211/211A only) is set to Enabled. If the images are still blurred adjust the metal ring until the image is sharp, see *Removing and attaching the lens*, on page 48. |
| Rolling dark bands or flickering in image. | Try adjusting the Flicker-free exposure setting under advanced image settings. Note that the 'Hold Current'/Manual setting may cause unwanted effects. |

**Video/image problems – MPEG-4**

| | |
|---|---|
| Lower frame rate than expected. | Check with the administrator that there is enough bandwidth available. Check also the settings for bit rate control, in the **Video & Image > Advanced > MPEG-4** settings. Using an inappropriate video object type can also affect the frame rate. See the online help for more information.<br>Check in the AMC control panel applet (MPEG-4 tab) that video processing is not set to **Decode only I frames**.<br>Lower the image resolution.<br>Reduce the number of applications running on the client computer. |
| No MPEG-4 displayed in the client. | Check that the correct network interface is selected in the AMC control panel applet (network tab).<br>Check that the relevant MPEG-4 connection methods are enabled in the AMC control panel applet (network tab).<br>In the AMC control applet, select the MPEG-4 tab and click the button Set to default MPEG-4 decoder. |
| No multicast MPEG-4 displayed in the client. | Check with your network administrator that the multicast addresses used by the AXIS 210/210A/211/211A are valid for your network. |
| Multicast MPEG-4 only accessible by local clients. | Check if your router supports multicasting, or if the router settings between the client and the server need to be configured. The TTL (Time To Live) value may need to be increased. |

| | |
|---|---|
| Poor rendering of MPEG-4 images. | Color depth set incorrectly on clients. Set to 16-bit or 32-bit color.<br>If text overlays are blurred, or if there are other rendering problems, you may need to enable Advanced Video Rendering. This is done on the MPEG-4 tab in the AMC control panel applet.<br>Ensure that your graphics card is using the latest device driver. The latest drivers can usually be downloaded from the manufacturer's web site.<br>If images are degrading, try decreasing the GOV length, see *Advanced Settings*, on page 19. |
| Color saturation is different in MPEG-4 and Motion JPEG. | Modify the settings for your graphics adapter. Please see the adapter's documentation for more information. |

**The test image does not display as expected.**

| | |
|---|---|
| Image settings. | Not all settings have an effect on the test image. For more information, see the help on Image Settings. |

**The Power indicator is not constantly lit**

| | |
|---|---|
| Faulty power supply. | Check that you are using an AXIS PS-K power supply. |

**The Status and Network indicator LEDs are flashing red rapidly**

| | |
|---|---|
| Hardware failure. | Contact your Axis dealer. |

**The Status indicator LED is flashing red and the camera is inaccessible**

| | |
|---|---|
| A firmware upgrade has been interrupted or the firmware has otherwise been damaged. | See the *Emergency Recovery Procedure* above. |

**Poor quality snapshot images**

| | |
|---|---|
| Screen incorrectly configured on your workstation. | In Display Properties, configure your screen to show at least 65000 colors, i.e. at least 16-bit. Using only 16 or 256 colors will produce dithering artifacts in the image. |

**Browser freezes**

| | |
|---|---|
| Netscape 7.x or Mozilla 1.4 (or later) can sometimes freeze on a slow computer. | Lower the image resolution. |

**Problems uploading files**

| | |
|---|---|
| Limited space. | There is only limited space available for the upload of your own files. Try deleting one or more existing files, to free up space. |
| Missing images in uploads. | This can occur when trying to use a larger image buffer than is actually available. Try lowering the frame rate or the upload period. |

**Overlay is not displayed**

| | |
|---|---|
| Incorrect size or location of overlay. | The overlay may have been positioned incorrectly. Refer to the online help for information on the limitations when using image overlays and privacy masks. |

**Motion Detection triggers unexpectedly**

| | |
|---|---|
| Changes in luminance. | Motion detection is based upon changes in luminance in the image. This means that if there are sudden changes in the lighting, motion detection may be mistakenly triggered. Lower the sensitivity setting to avoid problems with luminance. |

**No audio (AXIS 210A/211A only)**

| | |
|---|---|
| Incorrect setup. | Check that the sound card in the PC and the connections to the speaker and microphone are working. Ensure that the mute button is not pressed and the volume settings are correct. Ensure that full-duplex is selected if you want to have two way audio communication. |
| Post Content Length in proxy server. | The Post Content Length set in the proxy server is too low. Set the value of the Post Content Length in your proxy server to 1MB or more. You may need to contact your system administrator to do this. |

| | |
|---|---|
| Full duplex not supported. | Sound card does not support full-duplex. For information on how to check if your sound card supports full-duplex, please visit http://support.microsoft.com |
| Firewall or router settings. | The AXIS 210A/211A works locally, but not externally. Check the Internet firewall settings with your system administrator or reconfigure the default router settings. |
| DC power not enabled for microphone. | If the microphone has a built-in amplifier then the DC power must be enabled on the Audio Settings page. |
| **Audio volume too low/high** | |
| Volume settings incorrect. | The volume of the microphone or speaker connected to the AXIS 210A/211A is either too high or too low. Change the volume for the speaker or microphone in the Live View page. |
| Input and output gain set incorrectly. | Change the input gain for the microphone and the output gain for the speaker to adjust the audio levels on the Audio Settings page. |
| **Poor audio quality** | |
| Too many users. | Too many users/clients connecting to the AXIS 210A/211A may affect the sound quality adversely. Try limiting the number of clients allowed to connect on the Audio Settings page. |
| User too close to microphone. | Enable the speech filter in **Audio > Advanced Settings**. |
| Feedback from speaker. | Enable the echo cancellation filter in **Audio > Advanced Settings**. |
| Background noise. | Adjust the noise cancellation threshold and attenuation to reduce background noise levels in **Audio > Advanced Settings**. |
| CPU overloaded. | Reduce the number of listeners and viewers and decrease the image resolution and compression. |

For additional assistance, please contact your reseller or see the support pages on the Axis Website at www.axis.com/techsup

# Technical Specifications

| Item | Specification |
|---|---|
| Models | • AXIS 210<br>• AXIS 210A: Power over Ethernet, audio<br>• AXIS 211: Power over Ethernet, DC-iris<br>• AXIS 211A: Power over Ethernet, DC-iris, audio |
| Video compression | • Motion-JPEG<br>• MPEG-4 Part2 (ISO/IEC 14496-2), Profiles: ASP and SP |
| Resolutions | 16 resolutions (640x480 to 160x120) via API, 5 selections via configuration web page. |
| Frame rates | Up to 30 fps in all resolutions |
| Video streaming | • Simultaneous Motion JPEG and MPEG-4<br>• Controllable frame rate and bandwidth<br>• Constant and variable bit rate (MPEG-4) |
| Image settings | • Compression levels: 11 (Motion JPEG)/23 (MPEG-4)<br>• Rotation: 90°, 180°, 270°<br>• Configurable color level, brightness, contrast, white balance, exposure control, fine tuning of behavior in low light<br>• Overlay capabilities: time, date, text, custom image, privacy mask (AXIS 210A/211A only) |
| Image sensor | Image sensor: 1/4" Sony Wfine progressive scan RGB CCD. |
| Lens | • AXIS 210/210A - 4.0 mm, F2.0, fixed iris, horizontal viewing angle: 48°, focus range: 0 mm to infinity, CS mount<br>• AXIS 211/211A - F1.0 varifocal 3.0 - 8.0 mm, DC-iris, horizontal viewing angle: 27°-67°, focus range: 0.2 m to infinity, CS mount |
| Minimum illumination | • AXIS 210/210A: 3 Lux, F2.0<br>• AXIS 211/211A: 0.75 Lux, F1.0 |
| Shutter time | Electronic Shutter: 2 - 1/12500 seconds. |
| Security | • Multiple user access levels with password protection<br>• IP address filtering<br>• HTTPS encryption (AXIS 210A/211A only) |
| Users | • 20 simultaneous viewers for Motion JPEG and/or unicast MPEG-4<br>• More than 20 viewers possible when using MPEG-4 multicast |
| Alarm and event management | • Built-in multi-window motion detection, external I/O, triggered and scheduled events with several notification options,<br>• Event notification via TCP, email, HTTP and external output<br>• Image upload via FTP, email and HTTP<br>• Pre/post alarm buffers:<br>AXIS 210/211: 1.2 MB (up to 40 sec 320x240 video at 4 fps)<br>AXIS 210A/211A: 9 MB (up to 5 min 320x240 video at 4 fps) |
| Connectors | • Ethernet 10BaseT/100BaseTX, RJ-45<br>• Terminal block for I/O (1 alarm input, 1 output), alternative power connection<br>• (AXIS 210A/211A only)<br>3.5 mm jack for Mic in (max 270 mVpp) or Line mono input (max 3.2 Vpp)<br>3.5 mm jack for Line mono output (max 3.0 Vpp) to active speaker |

| Item | Specification |
|---|---|
| **Processors, memory, clock** | • CPU: ETRAX 100LX 32bit<br>• Video processing and compression: ARTPEC-2<br>• RAM memory: 16 MB (AXIS 210/211) 32 MB (AXIS 210A/211A)<br>• Flash memory: 4 MB (AXIS 210/211) 8 MB (AXIS 210A/211A)<br>• Battery backed up real-time clock |
| **Power** | • 7-20V DC, max 5W<br>• Power over Ethernet (IEEE 802.3af), power classification Class 0 (AXIS 211) or Class 2 (AXIS 210A/211A) (max 6.49 W) |
| **Operating conditions** | • Temperature: +5ºC to +45ºC (41ºF to 113ºF)<br>• Humidity: 20-80% RH. |
| **Audio (AXIS 210A/211A)** | • Full-duplex, half-duplex, simplex or no audio<br>• Encoding formats (selected under System Options):<br>ADPCM format at 24kbps, 8 kHz sampling (G.726 - select G723 from drop-down list)<br>ADPCM format at 32kbps, 8 kHz sampling (G.726 - select G721 from drop-down list)<br>PCM µ–law format at 64kbps, 8 kHz sampling (G.711 default)<br>• Built-in microphone with adjustable input sensitivity (low/high).<br>• External audio input: Single 3.5mm input for a mono microphone, or line-in mono signal (left channel is used from a stereo signal).<br>• Microphone input sensitivity: High = max -38 dBu (28 mVpp), Low = max -18 dBu (277 mVpp)<br>• Line input: max: 3.2 dBu (3.2 Vpp)<br>• DC power through input connector for external microphones supported.<br>• Audio output (line level) connects to PA system or active speaker with built-in amplifier. Headphones can also be connected. A stereo connector must be used for the audio out.<br>• Audio output: max 3.0 Vpp (+2.7dBu)<br>• Audio output impedance: min 32 ohm |
| **Installation, management and maintenance** | • Installation tool on CD, web-based configuration<br>• Configuration backup and restore<br>• SNMP support (AXIS 210A/211A only)<br>• Firmware upgrades over HTTP or FTP, firmware available at www.axis.com |
| **Video access from Web browser** | • Camera live view<br>• Sequence tour capability for up to 20 Axis cameras<br>• Customizable HTML pages |
| **Minimum web browsing requirements** | • Pentium III CPU 500 MHz or higher, or equivalent AMD<br>• 128 MB RAM<br>• AGP graphic card, Direct Draw, 32 MB RAM<br>• Windows XP, 2000, NT4.0*, ME* or 98* (* Motion JPEG only)<br>• DirectX 9.0 or later<br>• Internet Explorer 5.x or later<br><br>For other operating systems and browsers, see www.axis.com/techsup |

| Item | Specification |
|---|---|
| **System integration support** | • Powerful API for software integration available at www.axis.com<br>• Event trigger data in video stream<br>• AXIS Media Control SDK<br>• Embedded scripting support<br>• Watchdog secures continuous operation, can be monitored by other systems via event notification<br>• Embedded operating system: Linux 2.4 |
| **Supported protocols** | IP, HTTP, TCP, ICMP, RTSP, RTP, UDP, IGMP, RTCP, SMTP, FTP, DHCP, UPnP, ARP, DNS, DynDNS, SOCKS, NTP etc.<br>Additional protocls for AXIS 210A/211A: HTTPS, SSL/TLS*, SNMPv1/v2c/v3 (MIB-II).<br>More information on protocol usage available at www.axis.com<br>*This product includes software developed by the Open SSL Project for use in the Open SSL Toolkit. See www.openssl.org |
| **Approvals - EMC** | • EN 55024:1998+A1+A2<br>• EN 55022:1998+A1 (CISPR 22:1997+A1) Class B<br>• EN 61000-3-2:2000<br>• EN 61000-3-3:1995+A1<br>• VCCI:2003, Class B, ITE (CISPR 22:1997+A1:2000, Class B)<br>• C-Tick AS/NZS 3548: demonstrated by compliance with EN 55022:1998 (CISPR 22:1997) Class B<br>• FCC part 15, Subpart B, Class B: demonstrated by compliance with EN 55022:1998 (CISPR 22:1997) Class B |
| **Approvals - Safety** | • EN 60950<br>• UL, CSA (PS-K Power adapter) |
| **Dimensions - AXIS 210/210A** | • HxWxD: 38 x 88 x 146mm (1 1/2 x 3 7/16 x 5 3/4")<br>• Weight: 305g (10 3/4 oz) Power adapter excluded. |
| **Dimensions - AXIS 211/211A** | • HxWxD: 38 x 95 x 172mm (1 1/2 x 3 3/4 x 6 15/16")<br>• Weight: 345g (12 3/16 oz) Power adapter excluded |
| **Complimentary software** | • AXIS Media Control (AMC) - ActiveX component software required for Microsoft Internet Explorer - installed automatically on first use<br>• Optional: AXIS IP Utility - for installation in Windows. |
| **MPEG-4 licensing** | License for one MPEG-4 encoder and one MPEG-4 decoder included. Additional licenses available from Axis dealers. |
| **Accessories (not included)** | • IP65-rated outdoor housings for installation outdoors or in adverse indoor environments<br>• Power over Ethernet midspans<br>• AXIS 292 Network Video Decoder<br>• AXIS MPEG-4 Decoder 10-user license pack |
| **Available applications (not included)** | • AXIS Camera Station - Surveillance application for viewing, recording and archiving up to 25 cameras<br>• AXIS Camera Recorder - Surveillance application for viewing and recording up to 16 cameras<br>• AXIS Camera Explorer – Basic software for viewing and manual recording<br>• See www.axis.com/partner/adp_partners.htm for more software applications via partners |

## General performance considerations

When setting up your system, it is important to consider how various settings and situations will affect performance. Some factors affect the amount of bandwidth (the bit rate) required, others can affect the frame rate, and some will affect both. If the load on the CPU reaches its maximum, this will also affect the frame rate.

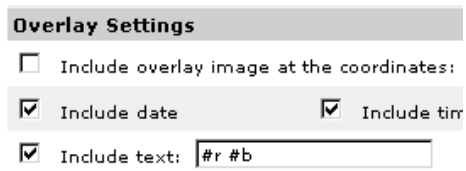
The following factors are among the most important to consider:

- High image resolutions and/or lower compression levels result in larger images. Bandwidth affected.
- Access by large numbers of Motion JPEG and/or unicast MPEG-4 clients. Bandwidth affected.
- Simultaneous viewing of different streams (resolution, compression, etc.) by different clients. Frame rate and bandwidth affected.
- Accessing both Motion JPEG and MPEG-4 video streams simultaneously. Frame rate and bandwidth affected.
- Heavy usage of event settings affects the camera's CPU load. Frame rate affected.
- Enabled motion detection. Frame rate and bandwidth affected.
- Heavy network utilization due to poor infrastructure. Bandwidth affected
- Viewing on poorly performing client PC's lowers perceived performance. Frame rate affected.

## Optimizing your system

To see the bandwidth and frame rate currently required by the video stream, the AXIS 210/210A/211/211A provides a tool that can be used to display these values directly in the video image.

To do this, special format strings are added as part of a text overlay. Simply add **#r** (average frame rate in fps) and/or **#b** (average bandwidth in kbps) to the overlay.




For detailed instructions, please see the online help for **Video & Image > Overlay Settings**, and the help for **File Naming & Date/Time Formats**.

**Important!**

- The figures displayed here are the values as delivered by the camera. If other restrictions are currently in force, (e.g. bandwidth limitation) these values might not correspond to those actually received by the client.
- For Motion JPEG, these values will be accurate as long as no frame rate limit has been specified.

## Frame rates - Motion JPEG and MPEG-4

The following table show typical frame rates in frames/second (fps) for Motion JPEG and MPEG-4 video streams from the AXIS 210/210A/211/211A.

Note that these values are guidelines only - actual values may vary.

Motion JPEG settings:

- Viewing in AMC
- Compression level = 30%

MPEG-4 settings:

- Viewing in AMC
- Compression level = 30%
- Video Object Type = Advanced Simple
- GOV length = 8
- GOV structure = IP*

*Note that setting the GOV structure to use "I-frames only" will increase the frame rate at the expense of the bit rate.

| | Frame rates | |
|---|---|---|
| | Motion JPEG | MPEG-4 |
| 640x480 | 30 | 21 |
| 480x360 | 30 | 30 |
| 320x240 | 30 | 30 |
| 160x120 | 30 | 30 |

## Bandwidth

As there are many factors that affect bandwidth, it is very difficult to predict the required amounts. The settings that affect bandwidth are:

- the image resolution
- the image compression
- the frame rate
- the MPEG-4 object type
- the MPEG-4 GOV structure
- the maximum exposure time.

There are also factors in the monitored scene that will affect the bandwidth. These are:

- the amount of motion
- the image's complexity
- the lighting conditions.

For MPEG-4, if there is only limited bandwidth available, and if this is more important than the image quality, using a constant bit rate (CBR) is recommended. Use a variable bit rate (VBR) if the image quality needs to be maintained at a higher level. If supported on the network, consider also using MPEG-4 multicasting, as the bandwidth consumption will be much lower.

# Glossary of Terms

**Active Speaker** - a speaker with a built-in power amplifier.

**ActiveX** - A control (or set of rules) used by a browser. ActiveX controls are often downloaded and installed automatically as required.

**ADPCM** - Adaptive Differential Pulse Code Modulation. Predicts the analog signal digitally and the difference is coded.

**AMC** - AXIS Media Control. The control required for viewing video images in Internet Explorer. Installs automatically on first use.

**API** - Application Programming Interface. The Axis API can be used for integrating Axis products into other applications.

**ARP** - Address Resolution Protocol. A protocol for assigning an IP address to a physical device address that is recognized in the local network. The ARP command can be used to set the IP-address for your product.

**ARTPEC** - Axis Real Time Picture Encoder - used for video image compression.

**CCD** - Charge Coupled Device. CCD is one of the two main types of image sensors used in digital cameras. When a picture is taken, the CCD is struck by light coming through the camera's lens. Each of the thousands or millions of tiny pixels that make up the CCD convert this light into electrons.

**CGI** - Common Gateway Interface. A set of rules (or a program) that allows a Web Server to communicate with other programs.

**Client/Server** - Describes the network relationship between two computer programs in which one, the client, makes a service request from another - the server.

**dB (Decibels)** - A unit to measure sound level changes. A 3dB change is the smallest level change we can hear. A 3dB change is actually twice or half the audio power level. A gain of 0dB will leave the signal level unchanged.

**DC-Iris** - This special type of iris is electrically controlled by the Axis camera, to automatically regulate the amount of light allowed to enter.

**DNS** - The Domain Name System (DNS) locates and translates Internet domain names into IP (Internet Protocol) addresses.

**Ethernet** - A widely used networking standard.

**ETRAX** - Axis' own microprocessor.

**Firewall** - A virtual barrier between a LAN (Local Area Network) and other networks, e.g. the Internet.

**FTP** - File Transfer Protocol. Used for the simple transfer of files to and from an FTP-server.

**Full duplex** - Transmission of data, e.g. audio, in two directions simultaneously.

**G.711** - G.711 is the international standard for encoding telephone audio on 64 kBit/s channel. It is a pulse code modulation (PCM) scheme operating at 8 kHz sample rate.

**G.726** - Frequently used speech-compression algorithm in telecommunications due to its high perceived speech quality and low resource requirements.

**Half duplex**- A half duplex link can communicate in only one direction, at a time. Two way communication is possible, but not simultaneously. Walkie-talkies and CB radios mimic this behavior in that you cannot hear the other person if you are talking.

**HTML** - Hypertext Mark-up Language. Used widely for authoring documents viewed in web browsers.

**HTTP** - Hypertext Transfer Protocol. The set of rules for exchanging files (text, images, sound, video, and other files) on the World Wide Web.

**Intranet** - A private network limited to an organization or corporation. Usually closed to external traffic.

**IP** - Internet-Protocol. See TCP/IP.

**IP address** - A unique number used by a network device, to allow it to be identified and found on the network. The 32-bit IP address is made up of four groups (or quads) of decimal digits separated by periods. An example of an IP address is: 192.168.0.1

**ISMA** - Internet Streaming Media Alliance

**JPEG** - A standard image format, used widely for photographs. Also known as JPG.

**LAN** - A local area network (LAN) is a group of computers and associated devices that typically share common resources within a limited geographical area.

**Linux** - A popular operating system, which is "open source" and practically free of charge.

**Lux** - A standard unit for the measurement of light, where 1 Lux equals the light emitted from a single candle at a distance of one meter.

**Mbit/s** - Megabits per second. A unit for measuring speeds in networks. A LAN might run at 10 or 100 Mbit/s.

**MPEG-4** - A standard video format, used for low bandwidth video streams.

**Multicast** - The same information is sent only once and only to the intended recipients.

**NTSC** - National Television Standards Committee. NTSC is the standard format used for televisions in most of North and Central America, and Japan.

**NWAY** - A network protocol that automatically negotiates the highest possible common transmission speed between two devices.

**PAL** - Phase Altering Line. PAL is the standard format used for televisions in most of the world (other than the US, Canada, and Japan).

**PCM** - Pulse Code Modulation. Analog signal converted directly to a digital.

**Ping** - A small utility used for sending data packets to network resources to check that they are working and that the network is intact.

**Pre/post alarm image** - The images from immediately before and after an alarm.

**Protocol** - A special set of rules governing how two entities will communicate. Protocols are found at many levels of communication, and there are hardware protocols and software protocols.

**Router** - A device that determines the next network point to which a packet should be forwarded on its way to its final destination. A router is often included as part of a network switch (see below).

**RTP**- Real-Time Transfer Protocol. A transfer protocol designed for delivery of live contents, e.g. MPEG-4.

**Simplex** - In simplex operation, a network cable or communications channel can only send information in one direction.

**SMTP** - A common e-mail protocol.

**Subnet Mask** - An IP address consists of two components: the network address and the host address. “Subnetting’ enables a network administrator to further divide the host part of the address into two or more subnets. The subnet mask identifies the subnet to which an IP address belongs.

**Switch** - Whilst a simple hub transmits all data to all devices connected to it, a switch only transmits the data to the device it is specifically intended for.

**TCP/IP** - Transmission Control Protocol/Internet Protocol. A suite of network protocols that determine how data is transmitted. TCP/IP is used on many networks, including the Internet. TCP keeps track of the individual packets of information and IP contains the rules for how the packets are actually sent and received.

**UPnP** - An “address” on the network. UPnP is an architecture for pervasive peer-to-peer network connectivity of intelligent appliances, wireless devices, and PCs of all form factors.

**URL** - Uniform Resource Locator. An “address” on the network.

**Varifocal** - A varifocal lens provides a wide range of focal lengths, as opposed to a lens with a fixed focal length, which only provides one.

**WAN** - Wide-Area-Network. Similar to a LAN, but on a larger geographical scale.

**Web server** - A program on a computer (server) providing the resources (e.g. web pages) requested by the user (client).

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